

Prospectus
For
Williams Property
In-lieu Fee Wetland Mitigation Project

Located in
Putnam County, Tennessee



Prepared by:
Tennessee Wildlife Federation
300 Orlando Avenue
Nashville, TN 37209

October 21, 2016

1) **OBJECTIVES** (33 CFR 332.4(c)(2))

The goal of the Williams Project is to provide wetland habitat suitable for compensation of losses of the waters of the United States in Tennessee resulting from the construction of the Academy Sports Distribution Center (Project Victor) in Putnam County.

The mitigation area currently contains wetland areas which have been significantly degraded by agricultural production and hydrologic alteration (ex. diversions, ditching). The objectives of the project are to enhance approximately 7.42 acres of ecologically diverse bottomland hardwood forest (PF01) for wildlife habitat, and improve water quality through reduced nutrient and sediment loading from nearby agricultural practices. These objectives address specific needs of the Caney Fork watershed (05130108) as outlined in TDEC's Watershed Water Quality Management Plan (2003) for the watershed.

2) **SITE SELECTION** (CFR 332.4(c)(3))

The project is located in Putnam County, Tennessee (**Figure 1**), approximately 2 miles southwest of the Cookeville, Tennessee city limits. The project was selected due to its close proximity to existing impacts within the Caney Fork Service Area, and specific needs of the Cane Creek watershed. In addition, the project has a high likelihood of restoring ecologically self-sustaining aquatic resources due to existing site hydrology.

- *HUC-8 Watershed:* Caney Fork (05130108)
- *HUC-12 Watershed:* Cane Creek (051301080703)
- *Level III Ecoregion:* Interior Plateau
- *Lat/Long:* 36.119; -85.575
- *Watershed Size:* 10 square miles
- *Location:* Terminus of Fowler Montgomery Road

The most imminent threats to aquatic resources in the Cane Creek watershed are associated with incompatible agricultural practices in rural areas, and discharges associated with MS4 permits in developed areas. Both livestock production and row cropping are prevalent throughout the region. Outright conversion of wetlands to agricultural uses in the watershed have slowed since the 1980's. However, agriculture continues to have a significant impact on the remaining wetlands and riparian areas (see 2007 Aerial Photograph in **Figure 2**), with alterations in stream side vegetative cover listed as a cause of impairment in TDEC's Draft Year 2016 303(d) List report.

Land cover in the watershed consists of a mosaic of cropland, pasture, woodland, and oak-hickory-pine forest with development encroaching in the northern portions of the watershed. Natural vegetation has been cleared for agriculture and urban development on about 24 percent of the watershed, and agriculture and forestry are prevalent land uses. The watershed is sparsely populated outside of the northern portion of the watershed within the Cookeville, TN city limits.

3) **SITE PROTECTION INSTRUMENT** (CFR 332.4(c)(4))

The property is privately owned by Johnnie and Lisa Williams. The Tennessee Wildlife Federation (TWF) administers the Tennessee Mitigation Fund in-lieu fee wetland mitigation program. Chris Roberts is the Director of Conservation for TWF, and oversees the Fund. Chris is also the principal investigator on the project. Chris has overseen numerous stream and wetland habitat restoration projects in Tennessee, Alabama, and New York over the last 21 years. TWF is the oldest conservation organization in Tennessee, and currently stewards nearly 11,000 acres under conservation easement. TWF has standards and practices to ensure conservation efforts are lasting and meet national standards of excellence.

The mitigation area will be permanently protected with a conservation easement held by the TWF. A draft conservation easement for the project is in **Appendix 1**. The conservation easement will provide long-term protection of the mitigation area and prohibit incompatible uses that might otherwise jeopardize the objectives of the project.

4) **BASELINE INFORMATION** (CFR 332.4(c)(5))

The mitigation area is approximately 12.13 acres, and is currently 100% in agricultural production. Wetlands at both sites are low quality due to ongoing agricultural practices. Wetland determination sheets documenting site conditions at various times of the year are included in **Appendix 2**. Delineated wetland boundaries and wetland investigation locations are identified in **Figure 3**.

A TVA power line bisects the mitigation area. The right of way associated with the power line is a total of 75 feet wide. According to the TVA project manager for the Cookeville area, there is no written maintenance plan for the subject power line. The following is a maintenance summary provided by TVA regarding maintenance of the subject power line: "TVA manages the line on a three-year cycle, either bush-hogging or spraying as needed. Once the wetland habitat is re-established, TVA will use EPA approved aquatic herbicides applied with backpack sprayers to selectively spray only the woody species. If the line is bush-hogged, TVA will use tractors or if the area is too wet TVA will hand cut the brush and leave in place. TVA's end goal for a ROW is to be a meadow like state, low growing species and non woody stem plants."

Site 1 is to the west of the TVA power line, and is bordered on the western property boundary by Cane Creek. The area is 5.93 acres, of which 3.847 acres has been delineated as existing wetland. Site 2 is to the east of the TVA power line and is 6.20 acres, of which 3.58 acres has been delineated as existing wetland.

- A. **Hydrology**: The mitigation area lies within the floodplain of Cane Creek and an unnamed tributary to Cane Creek. Despite an extensive history of agriculture, the mitigation area shows primary hydrology from flooding of Cane Creek and an unnamed tributary to Cane Creek (See Site Photos in **Appendix 3**). Surface flow from this flooding (primarily from the tributary) is the primary hydrology source, with some secondary capture and detention

during precipitation due to concavity on the site and microtopographic relief. No berm, ditches or levees were observed on the site. The site is not known to contain plow pans, field crowns and/or tile drainage systems, and no evidence of these or other agricultural modifications that actively influence site hydrology were observed on the project site. No direct measurements of site hydrology have been conducted, however, observation of site conditions during precipitation events, and return visits during different seasons indicate that the saturation remains in the upper portion of the soil column for most of the year.

- B. Soils: According to NRCS Web Soil Survey, soil series mapped within Site 1 include Lindsie silt loam (Ln), and Melvin silt loam (Ma) (**Figure 4**). The site is not identified on the U.S. Fish and Wildlife Service National Wetlands Inventory (**Figure 5**), although areas similarly situated along the western side of Cane Creek are identified. Conversion to agricultural use has left the site degraded from its original wetland condition. Shallow soil profiles inspected by TMF staff throughout the mitigation area were observed to meet hydric criteria throughout the areas identified for wetland enhancement. Soil in the Melvin mapped area show redox features with manganese and iron concretions in a dark greyish brown matrix. The silt loam soil was observed with 10YR 4/3 colored matrix in the upper 6 inches of the profile. From 6 inches to 12 inches soil was observed with 10YR 5/3 colored matrix (90%) with 10YR 4/6 (10%) redox depressions. From 12 inches to the depth of the soil profile at 16 inches soil was observed with 10YR 5/2 colored matrix (80%) with 10YR 4/6 (20%) redox depressions. Upon a return visit with US Army Corps of Engineers and Tennessee Department of Environment and Conservation staff on June 27, 2016, soils in these areas were observed with 10YR 4/2 colored matrix in the upper 3 inches of the profile. From 3 inches to 12 inches soil was observed with 10YR 4/2 colored matrix (60%) with 7.5YR 5/6 (40%) redox depressions. These observations are mostly consistent with the soil series descriptions, with observed differences likely due to historic agricultural land use practices. For more detailed soils information, a NRCS Custom Soil Resource Report is in **Appendix 4**.
- C. Vegetation and Surrounding Land Uses: The entire parcel is approximately 29 acres including the mitigation area. The property has been a working farm for decades, mostly in pasture or row crops. The surrounding land use is mostly low density residential development just outside of the City of Cookeville. The low lying agricultural land was observed to have a mix of facultative to obligate herbaceous successional species, such as *Schenodorus arundinaceus*, *Juncus effusus*, *Carex frankii*, and *Diodia virginiana*.
- D. Additional Factors:
- Rare Species: There are no known rare species occurrences recorded from the project site, and no known rare species occurrences within one mile of the project site.

- Historic/Cultural Resources: TWF staff sent the TN State Archeologist a shapefile of the mitigation area, and there are no known resources known to exist at the site.

E. Sites Legal Description

Legal Description for Site 1:

Commencing at a found iron rod located in the northeast corner of the subject property, said iron rod being located in the northern right of way of Fowler Montgomery Road. Thence: N87°02'12"W, 827.72' to the corner of Wetland Mitigation Area 2. Thence; N N87°02'10"W, 82.34' to the true point of beginning, also being located in the southerly line of Sherrell (D.B. 733 Page 357). Thence; along in the westerly line of the 75' powerline easement S27°16'37"W, passing an iron pin set in a new fence line at 20.7' for a total distance of 852.32' to a point in the northerly line of Bohannon (D.B. 790 Page 488). Thence; with the northern line of Bohannon N83°15'18"W, 226.94' to a point in the centerline of Cane Creek, also being in the easterly line of waters (D.B. 698 Page 766). Thence; with the centerline of Cane Creek N04°15'36"E, 125.34' to a point. Thence; N49°59'43"E, 105.00' to a point. Thence; N53°34'22"W, 158.80' to a point. Thence; N39°20'47"W, 58.00' to a point located in the easterly line of Holmes (D.B. 336 Page 271). Thence; continuing with the centerline of Cane Creek N63°47'19"E, 123.28' to a point. Thence; N22°39'41"E, 138.75' to a point. Thence; S87°29'21"E, 39.93' to a point. N23°56'37"E, 188.00' to a point. Thence; S70°13'21"E, 121.43' to a point. Thence: N31°00'12"E, 116.67' to a point located on the southerly line of Sherrell (D.B. 733 Page 357). Thence; with the line of Sherrell S87°02'10"E, 236.49' to the point of beginning, containing 5.929 acres as surveyed by CEC Inc, H. Wade Lovin RLS# 2151 and Shown on survey dated 09/15/2016 bearing project # 163-028.

Legal Description for Site 2:

Commencing at a found iron rod located in the northeast corner of the subject property, said iron rod being located in the northern right of way of Fowler Montgomery Road. Thence: N87°02'12"W, 827.72' to the true point of beginning of Wetland Mitigation Area 2, said point also being in the southerly line of Sherrell (D.B. 733 Page 357). Thence; with the line of Wetland Mitigation Area 2 S33°37'09"W, passing an iron pin set in a new fence line at 51.7' for a total distance of 576.56' to an iron pin set. Thence; S64°21'57"W, 597.55' to an iron pin set in the northerly line of Bohannon (D.B. 790 Page 488), said point also being located on the easterly line of a 75' TVA powerline easement. Thence; with the common line of Wetland Mitigation Area 2 and the 75' powerline easement N27°16'37"E, passing an iron pin set in a new fence line at 839.22' for a total distance of 858.12' to a point located in the southerly line of Sherrell (D.B. 733 Page 357). Thence; with the common line of Sherrell and Wetland Mitigation Area 2 S87°02'10"E, 465.31' to the point of beginning, containing 6.199 acres as surveyed by CEC Inc, H. Wade Lovin RLS# 2151 and Shown on survey dated 09/15/2016 bearing project # 163-028.

5) DETERMINATION OF CREDITS (CFR 332.4(c)(6))

The mitigation area is 12.13 acres and will be enhanced through the following tasks (**Figure 6**):

1. The site will transition to bottomland hardwood species through vegetative plantings.
2. Install livestock exclusion fencing to prevent livestock from entering the mitigation area.

Table 2. Summary of Mitigation Approach

AREA	TREATMENT	ACRES	RATIO	CREDITS
1	Enhancement	3.85	4:1	0.96
2	Enhancement	3.58	4:1	0.89
			TOTAL	1.85

Enhancement is the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource functions(s). Enhancement does not result in a gain in aquatic resource area.

The proposed modifications consist of enhancement activities of returning the site to a functional floodplain forested hardwood wetland, but does not result in an increase in the size of the area, and requires no hydrologic manipulation or site work to convert the row cropland to a floodplain wetland area. Functional lift will be provided by revegetating the area with native woody species (see TRAM worksheets in **Appendix 5**). Revegetating the area will develop natural habitat by converting areas that have been altered to allow for agricultural production to native forested communities. The wetland area will be restored to a Palustrine forested broad-leaved deciduous wetland (PFO1) with a vegetated community typical for the region consisting of woody species such as sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), overcup oak (*Quercus lyrata*), black willow (*Salix nigra*), river birch (*Betula nigra*), and box elder (*Acer negundo*). Although no mitigation credits are being pursued, 4.7 acres of upland buffer will be permanently protected with a conservation easement to provide additional ecological diversity.

6) MITIGATION WORK PLAN (CFR 332.4(c)(7))

As a result of clearing and degradation from agricultural impacts, the mitigation area currently provides very limited ecological function. Replanting with native vegetation in an effort to develop a sustainable, ecologically diverse bottomland hardwood forest, and erecting fencing to restrict access by cattle. Existing fencing on the north and south property boundaries will be augmented by installing fencing along the eastern portion of the mitigation area to ensure cattle do not enter the mitigation area. These actions are proposed based on extensive research on soils, hydrology, topography, and vegetation assemblages from existing wetland restoration and enhancement projects in the region.

The restoration of bottomland hardwoods will serve a critical role in the Caney Fork River watershed by reducing the severity of flooding to downstream communities, and improving water quality by filtering nutrients, processing organic wastes, and reducing sediment. Bottomland hardwood wetlands are also extraordinarily rich in wildlife, more so than most other forest types due to abundant cover and leaf litter, structurally complex and diverse vegetation, and alternating wet and dry periods.

Grading, Erosion Control & Stormwater Protection Plan

No significant grading will take place in the mitigation area and, therefore, no grading, erosion control, or stormwater protection plan is needed for this project. However, soil disturbance will be considerably less than 1 acre. A native wetland herbaceous seed mix will be planted and covered with straw over any borrow areas at Site 1 upon completion of construction activities.

Site Construction Plan and Timeline

TASK	TIMING
Prepare Sites for planting	November
Plant trees	December
Install monitoring equipment	January
Conduct baseline monitoring	March
Conduct annual monitoring	September - October
Submit annual monitoring report	October

Soil Management

Soils in both mitigation areas show indications of existing hydric characteristics, but have been heavily impacted by past and current agricultural activities. The proposed mitigation does not include soil amendment. Many areas on the Cane Creek floodplain within the same mapped soil series have developed wetland characteristics due to ponded water, and similar reversion is to be expected at the mitigation site.

Revegetation

Both sites will be revegetated with species acquired from regional native plant nurseries. All the plants used for revegetation will be native to the region and from local genotypes when possible. The plants used will be woody species in bare root seedling form, stocked from the Tennessee Division of Forestry state nursery.

Due to the recent agricultural activity and existing soil fertility at both sites, no disking or fertilizers are needed prior to vegetative plantings. Tree and shrub planting material will consist of bare root seedlings that are approximately 16-24 inches tall. Crooked, diseased, or injured trees will not be used. Trees and shrubs will be planted on 10 to 15 foot centers (~400 stems per

acre). Species to be planted at both sites shall consist of the species listed in Table 4. The selected species are known to thrive in wetland habitats in the Caney Fork River watershed.

Seedlings and shrubs will be transported at temperatures between 33° and 50° Fahrenheit, and be protected from direct sunlight and air currents. If seedlings must be stored, they will be kept at 34° to 40° Fahrenheit. Seedlings and shrubs will not be stacked more than two bags deep during transport. All trees and shrubs will be planted during the dormant season (between November 15 and March 15). A shovel or dibble tool will be used to create planting holes deep enough to prevent roots from curling. The soil will be firmed around the seedlings, and seedlings shall not lean more than 30°.

Table 4: Proposed Woody Planting Species

SCIENTIFIC NAME	COMMON NAME	GROWTH TYPE	WETLAND STATUS	QUANTITY
Wetland Plantings				
<i>Betula nigra</i>	river birch	Tree	FACW	400
<i>Cephalanthus occidentalis</i>	button bush	Shrub	OBL	400
<i>Cornus amomum</i>	silky dogwood	Shrub	FACW	400
<i>Quercus michauxii</i>	swamp chesnut oak	Tree	FACW	400
<i>Quercus lyrata</i>	overcup oak	Tree	OBL	400
<i>Salix nigra</i>	black willow	Shrub	OBL	100
<i>Platanus occidentalis</i>	sycamore	Tree	FACW	400
<i>Ulmus Americana</i>	American elm	Tree	FACW	400
<i>Populus deltoids</i>	Eastern cottonwood	Tree	FAC	100

7) **MAINTENANCE PLAN** (CFR 332.4(c)(8))

Using funds from existing advance credit sales, TWF will establish a fund of \$5,000 for the project in order to address any maintenance or remedial work needs during the monitoring period. Should any portion or aspect of the mitigation project not meet the specified success criteria based on reporting and/or additional visual observations in a monitoring year, the nature and cause(s) of the resulting condition shall be thoroughly investigated and documented. If it is determined that corrective action to a perceived problem area is not warranted at the time, the rationale for such a decision shall be stated. Continued monitoring of the condition or area, including the use of more detailed methodologies and at a more intensive rate, may be most appropriate. These actions shall also be documented. In instances where corrective action is deemed necessary, a plan shall be prepared which includes proposed actions, a schedule for completing the actions and a revised monitoring plan, if the mitigation is still within the monitoring phase. Upon meeting the specified success criteria for the project, any funds remaining in the maintenance fund set up for the project will be transferred to a fund set up for the long term management of the mitigation area (see **Section 10**).

8) **PERFORMANCE STANDARDS** (CFR 332.4(c)(9))

Performance standards are established to meet several objectives, including measuring the success of a project's specific objectives, and comparing the ecological improvement or increase in function and value of pre- and post-restoration and enhancement efforts (**Table 5**).

Table 5. Success Criteria for the Williams Wetland Mitigation Project – Putnam County

PERFORMANCE STANDARD	CRITERIA	REMEDIAL ACTION
Hydrophytic Woody Vegetation	Woody stem density > 200 stems per acre.	Supplemental planting
Hydrology	Saturation or inundation must occur within 12 inches of the surface for at least 5% of the growing season (14 consecutive days during the period of April 17 th through October 19 th) during years with normal precipitation. Additional hydrologic features sought will include sediment deposits, drift lines, drainage patterns, water marks, etc.	Hydrologic corrective action to be approved by the Corps, in consultation with the IRT
Hydric Soil	Soils, in areas previously determined as containing hydric characteristics, retain hydric indicators or meet the hydric soil criteria for inundation or saturation.	Hydrologic corrective action to be approved by the Corps, in consultation with the IRT

9) **MONITORING REQUIREMENTS** (CFR 332.4(c)(10))

The success of the mitigation efforts will be determined by following an established monitoring plan. The plan will document the success of the wetland enhancement activities by monitoring and documenting vegetation establishment and hydrology. These performance standards will be monitored in years 2, 3, 5, and 7. A planting report will be provided to the District Engineer no later than October 31st of the same year. Monitoring reports will be submitted after years 2, 3, 5, and 7. The monitoring reports will include the following:

1. Narrative description
2. Photo documentation
3. Vegetation survey data in at least three locations per site
4. Visual assessments
5. Hydrologic monitoring data

Photographic Monitoring Stations

Permanent photography stations will be established at each site. Four stations will be positioned to capture images along each of the cardinal directions and the fifth will be located in the center of the wetland to provide a visual approximation of vegetation density. Additional photographs will be taken throughout the survey to document significant observations such as natural recruitment of species. Photographs from these same stations will be taken in the subsequent years to document the evolution and development of the area.

Vegetation Sampling

The establishment of vegetation within the wetland area will be documented utilizing a regimented sampling protocol. This will include three 1m² plots that will be placed randomly throughout the wetland at each site. The location of the plots will be marked with rebar and a GPS location will be recorded so that the sample plots can be relocated. All species present within each of these plots will be identified and recorded where possible. Percent cover will also be measured in each plot to determine vegetation density.

Hydrology

The hydrology of the wetland will be documented both by observable indicators, such as water lines or saturated soils, and the water level data collected from EcotoneTM Water Level Recorders. At least one water level recorder will be installed in each wetland restoration area. They will be programmed to record the elevation of the water every 12 hours so that subtle fluctuations can be documented, such as the response of the water level to recent precipitation.

10) LONG-TERM MANAGEMENT PLAN (CFR 332.4(c)(11))

Following the completion of the monitoring period, the mitigation area will be visually inspected during annual stewardship visits by TWF. A long term management fund will be established with any funds remaining from the Maintenance Fund (See **Section 7**), and additional funding from credit sales. The long term management fund will be considered fully funded once it has accumulated a total of \$5,000. Management and maintenance activities include but are not limited to fence repair, maintenance of signage, conservation easement enforcement, access/gate maintenance, non-native invasive species management, and reporting.

11) ADAPTIVE MANAGEMENT AND MAINTENANCE PLAN (CFR 332.4(c)(12))

Should any portion or aspect of the mitigation project not meet the specified success criteria based on reporting and/or additional visual observations in a monitoring year, the nature and cause(s) of the resulting condition shall be thoroughly investigated and documented by TWF. If it is determined that corrective action to a perceived problem area is not warranted at the time, the rationale for such a decision shall be stated. Continued monitoring of the condition or area, including the use of more detailed methodologies and at a more intensive rate, may be most appropriate. These actions shall also be documented. In instances where corrective action is

deemed necessary, a plan shall be prepared which includes proposed actions, a schedule and revised monitoring plan.

12) FINANCIAL ASSURANCES (CFR 332.4(c)(13))

TWF is committed to ensuring all facets of the administration and implementation of the in-lieu fee program are meeting the highest standards. Funds from the Maintenance Fund will ensure project success during the monitoring period, and funds from the Long Term Management Fund will ensure that the conservation values of the mitigation area are protected in perpetuity. If necessary, TWF will utilize additional program resources to assure that the project meets the performance standards, and that the conservation values of the site are protected in perpetuity.

Figures

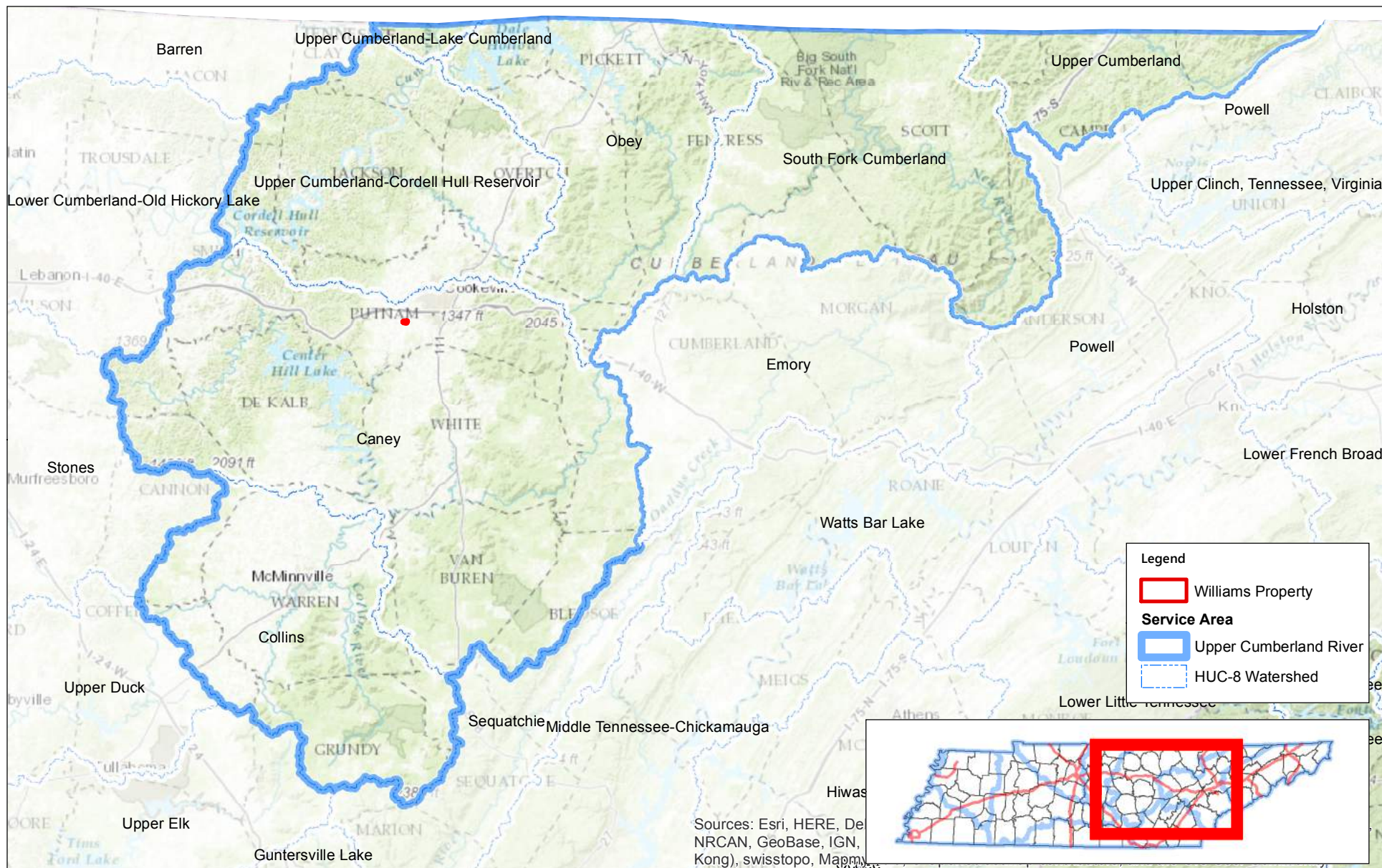


Figure 1. Project Location
Proposed Williams Mitigation Project
Putnam County, Tennessee

0 5 10 20 Miles



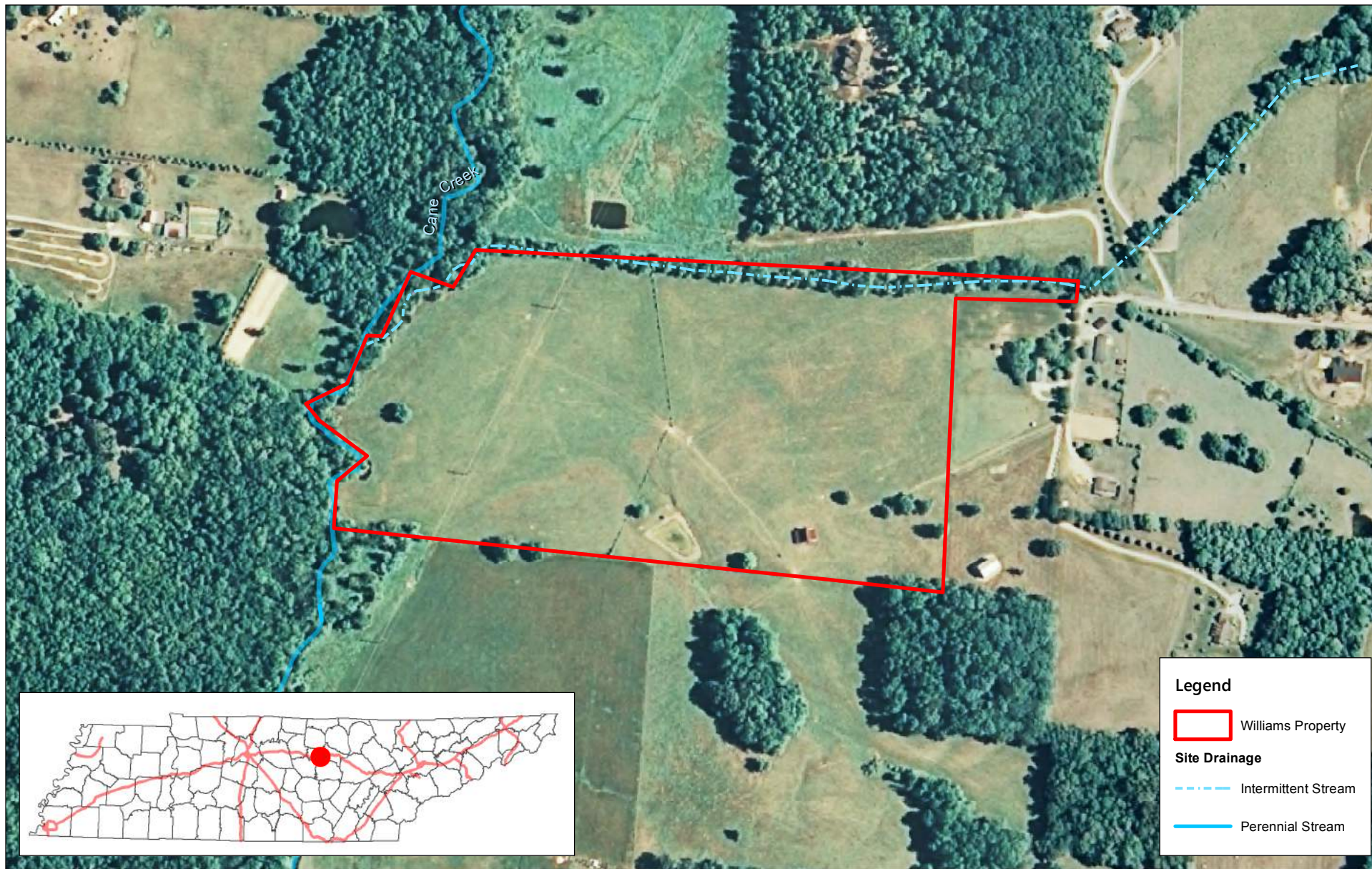


Figure 2: 2007 Aerial Photograph
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

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2607 Westwood Drive, Nashville, Tennessee | 615.460.9797 | www.bdy-inc.com

0 100 200 400 600 Feet



Date: 9/23/2016
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Map Center: 36.119154, -85.574471
Prepared For:
Prepared By:
Sources: ENTER SOURCES HERE

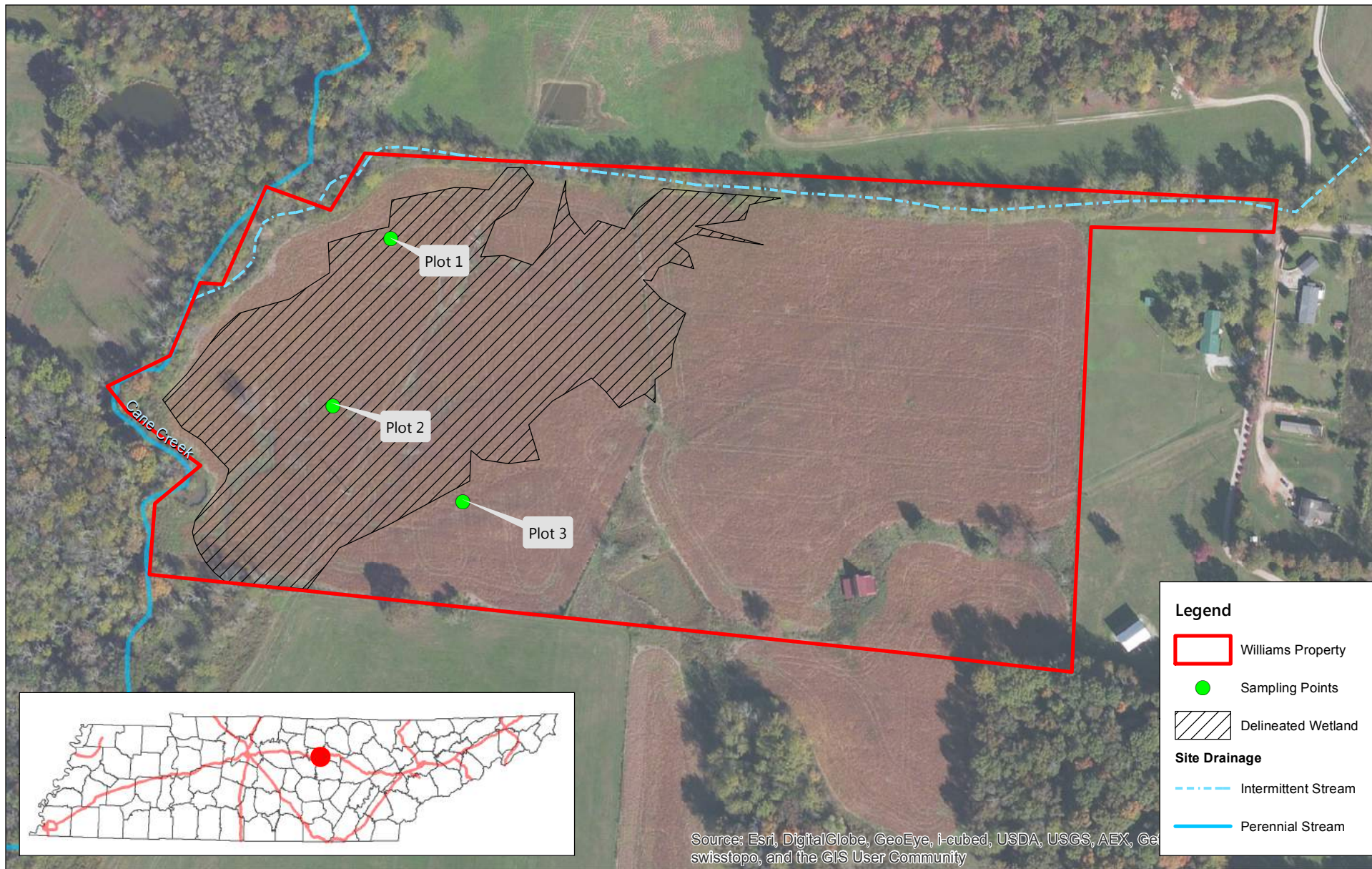
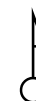


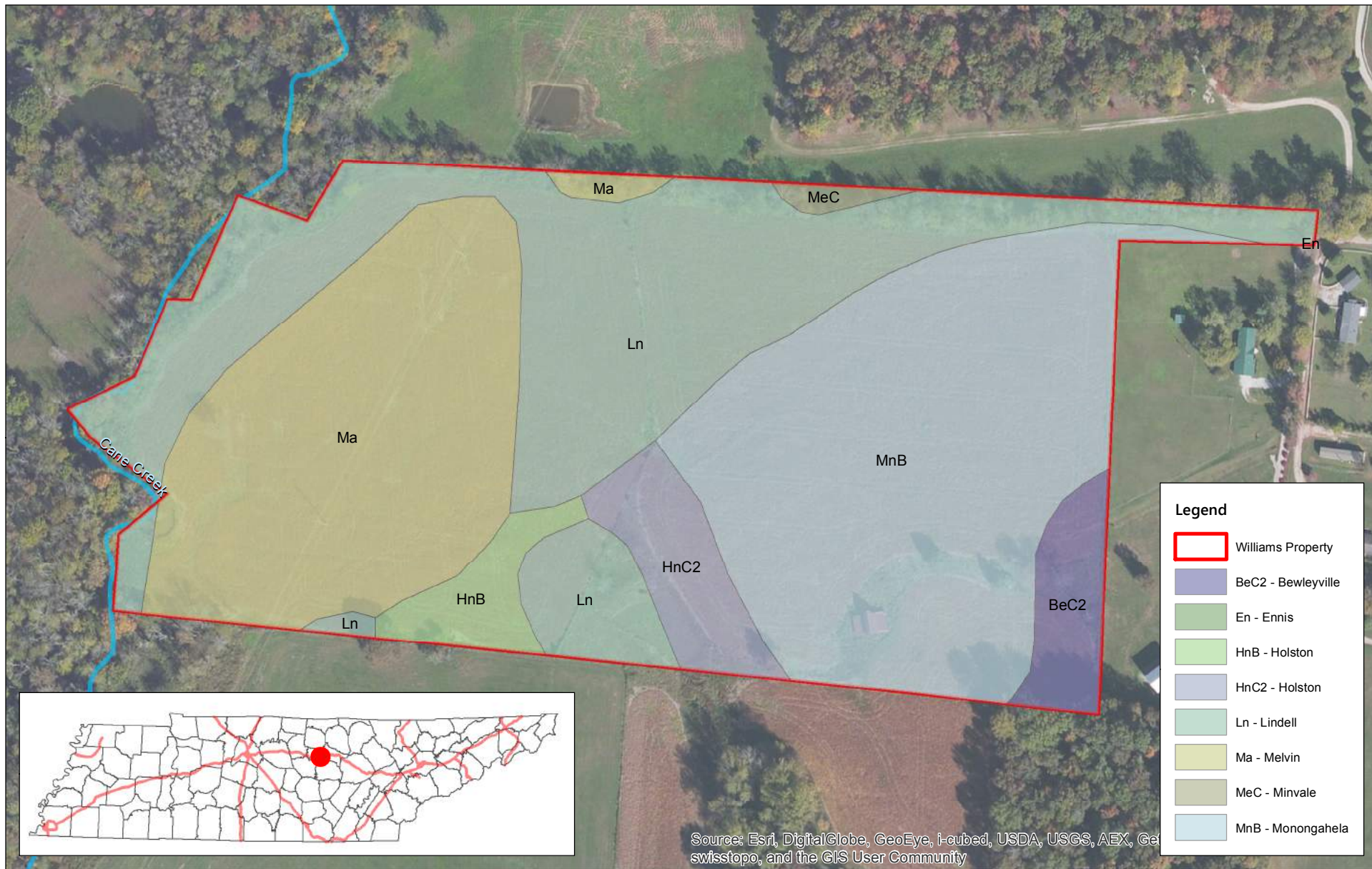
Figure 3: Existing Conditions
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

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0 100 200 400 Feet



Date: 9/23/2016
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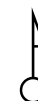
Legend

- Williams Property
- BeC2 - Bewleyville
- En - Ennis
- HnB - Holston
- HnC2 - Holston
- Ln - Lindell
- Ma - Melvin
- MeC - Minvale
- MnB - Monongahela

Figure 4: NRCS Mapped Soils
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

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0 100 200 Feet



Date: 9/23/2016
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Map Center: 36.119275, -85.574471
Prepared For:
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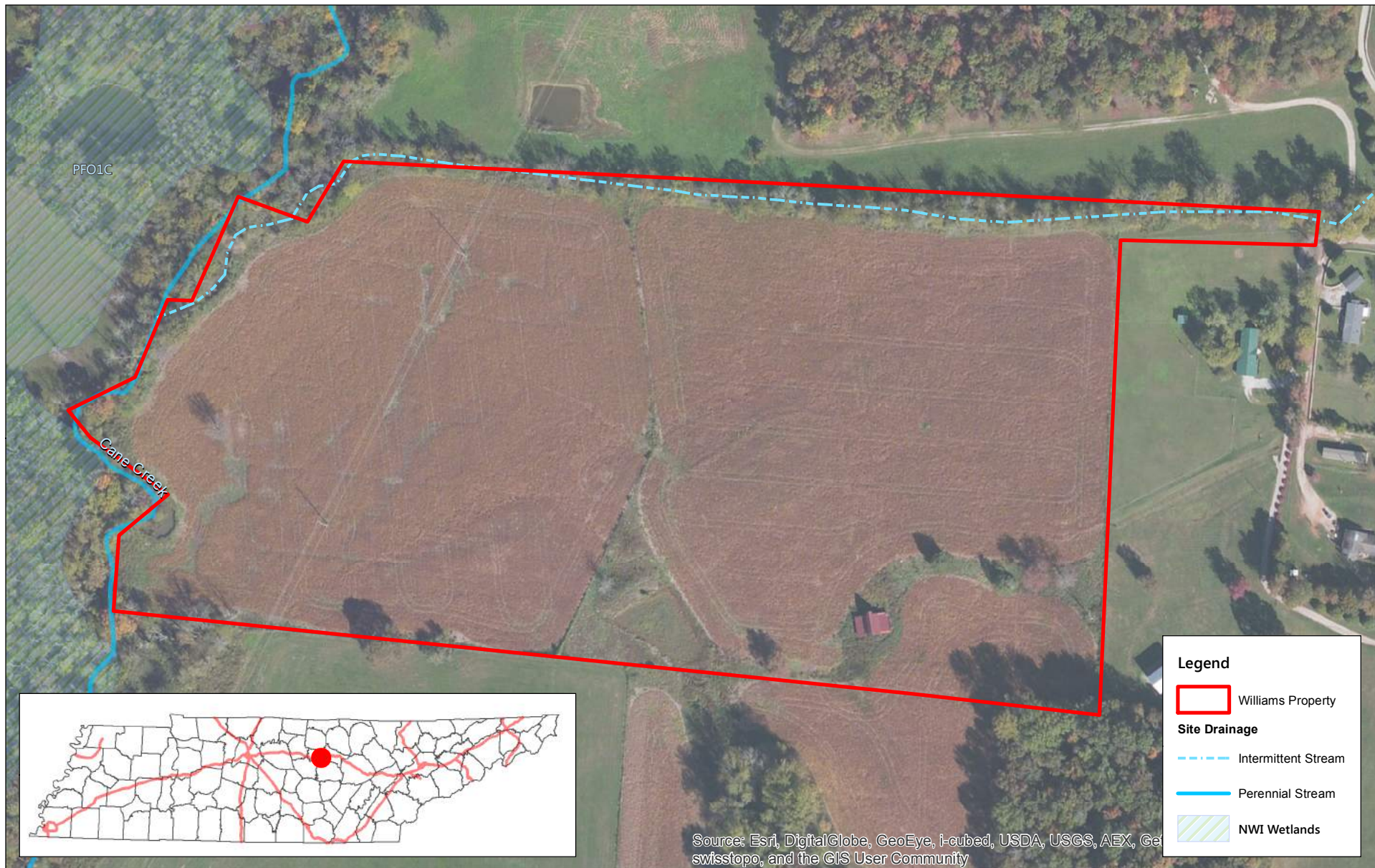
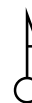


Figure 5: National Wetlands Inventory Map
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

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Date: 10/20/2016
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Sources: ENTER SOURCES HERE

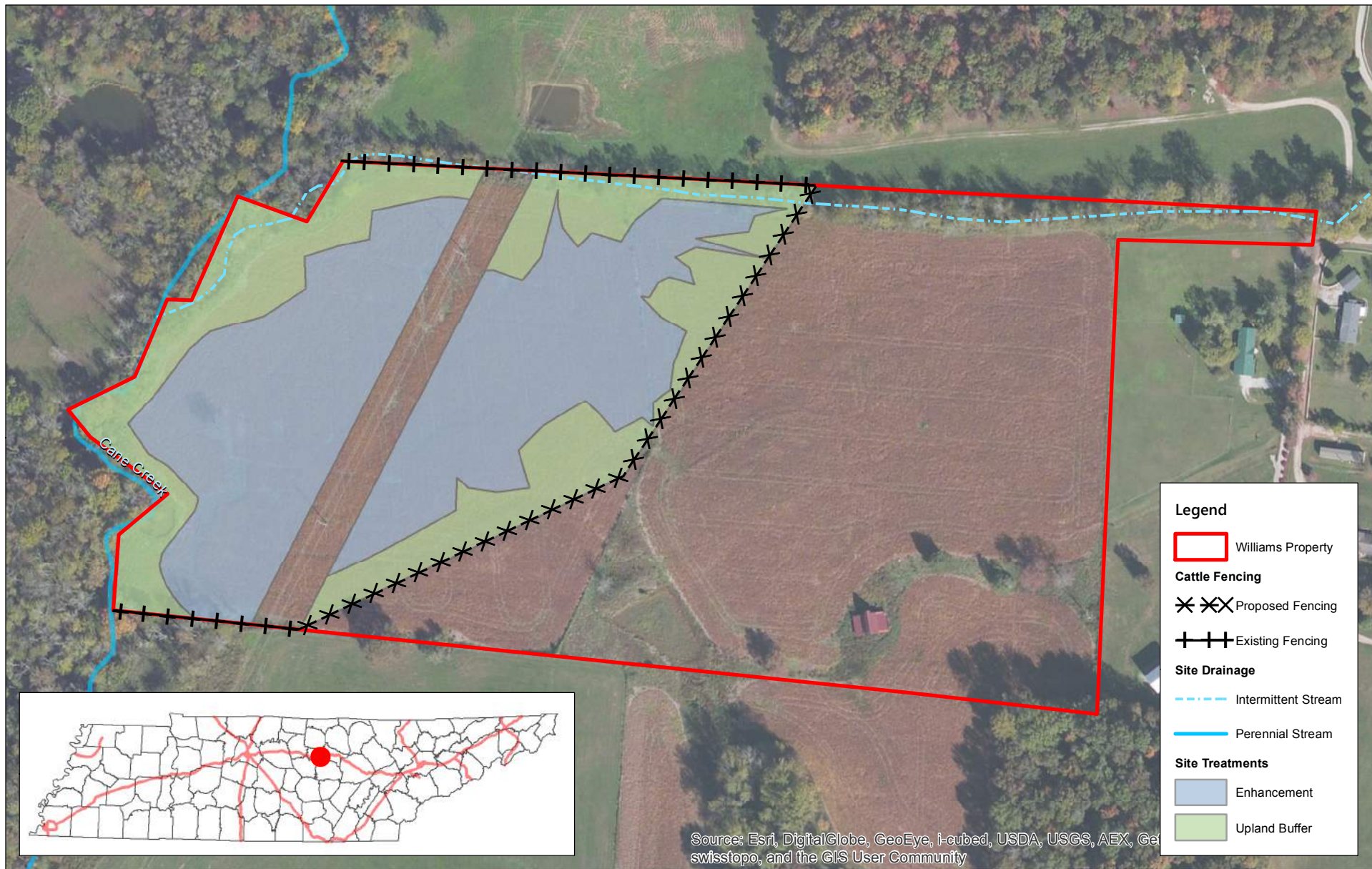
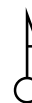


Figure 6: Proposed Conditions
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

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0 100 200 Feet



Date: 10/20/2016
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Map Center: 36.119275, -85.574471
Prepared For:
Prepared By:
Sources: ENTER SOURCES HERE

Appendix 1:
Draft Conservation Easement

This instrument prepared by:
BURR & FORMAN LLP (GTY)
511 Union Street, Suite 2300
Nashville, Tennessee 37219

Map/Parcel Number(s): Map 84 parcel 61.05
Owner/Responsible Taxpayer: Lisa and Johnnie Williams

CONSERVATION EASEMENT

On this ____ day of _____, 2016, and **FOR AND CONSIDERATION OF THE SUM OF \$67,000** the receipt and adequacy of which is hereby acknowledged, **JOHNNIE WILLIAMS**, and wife, **LISA WILLIAMS** (collectively "**Grantor**") has sold and by these presents does transfer and convey unto the **TENNESSEE WILDLIFE FEDERATION, INC.** ("**Grantee**"), a Tennessee non-profit corporation, for the purpose of forever conserving the Conservation Values of the Property (both as hereinafter defined).

WITNESSETH:

A. Grantee is (i) a Tennessee corporation with the power and capacity to hold an interest in real property; (ii) charitable in nature within the meaning of Sections 501(c)(3) and 509(a) of the Internal Revenue Code; (iii) a "public body" within the meaning of the Conservation Easement Act of 1981, Tennessee Code Annotated, §§ 66-9-301 *et seq.* (iv) a qualified organization within the meaning of Section 170(h)(3) of the Internal Revenue Code in that its purpose is the protection, conservation, enhancement and management of Tennessee natural areas and aquatic and wildlife resources for aesthetic, scientific, charitable, recreational and educational purposes.

B. Grantee operates a Statewide Wetland In-Lieu-Fee Program (the "Tennessee Mitigation Fund") pursuant to an "Instrument" approved and regulated in accordance with federal and state laws and regulations. The Tennessee Mitigation Fund provides compensatory mitigation for permitted impacts to wetlands in the State of Tennessee through the restoration, enhancement, establishment and/or preservation of wetlands.

C. Grantor is the fee simple owner of the real property (the "Property") situated in Hardin County, Tennessee, consisting of approximately twelve acres and more particularly described in Exhibit A attached hereto and incorporated herein by this reference.

D. Grantor and Grantee recognize that the Property possesses outstanding natural, scenic, biological and aquatic resources, collectively referred to herein as the "**Conservation Values**" of the Property, and are of great importance to the general public.

E. Grantee has identified the Property as one entitled to benefit from Grantee's compensatory mitigation efforts and has determined that the Property is in need of specific restoration, enhancement, establishment and/or preservation of wetlands.

F. The Grantor intends that the Conservation Values of the Property be preserved and maintained, and Grantor intends to convey to Grantee the right to preserve and protect the Conservation Values of the Property in perpetuity.

G. The parties desire to enter into this Conservation Easement, whereby Grantor shall grant to Grantee the easement described herein over and across the Property, pursuant to the Conservation Easement Act of 1981, to preserve, maintain, restore, and/or enhance the present condition, use, and/or natural beauty of the Property.

NOW, THEREFORE, in consideration of the recitals above, and the mutual covenants, terms, conditions and restrictions contained herein, the parties agree as follows:

1. Grant of Conservation Easement. Grantor for himself, and for Grantor's heirs, successors, and assigns, hereby gives, grants, and conveys unto the Grantor a permanent and exclusive conservation easement (this "Conservation Easement") on, over, and across the Property for the purposes of: (1) enabling the Property to benefit from the Wetland Mitigation Improvements (defined below) in order to conserve the Conservation Values of the Property; (2) preventing the use or development of the Property for any purpose or in any manner that would conflict with these features and characteristics; (3) assuring that there is no impairment or degradation to the quality of aquatic resources on the Property after the Wetland Mitigation Improvements are constructed on the Property; (4) ensuring that the Wetland Mitigation Improvements meet the applicable long term protection requirements of 33 C.F.R. Part 332 and corresponding state mitigation regulations; and, (5) providing necessary and reasonable access to Grantor and/or its agents to the Property for the purposes of constructing, installing, monitoring, and maintaining the Wetland Mitigation Improvements (collectively, the "Mitigation Purposes"). In addition, to the extent that the Property cannot be accessed by public road, Grantor grants an easement to Grantee for access to the Property on, over, and across the Property, in a manner that is consistent with the rights, obligations, and purposes of this Conservation Easement. Grantee agrees to hold this Conservation Easement exclusively for conservation purposes, as defined in Section 170(h)(4)(A) of the Internal Revenue Code.

2. Wetland Mitigation Activities.

(a) Development of Wetland Mitigation Plan. At its sole cost and expense, Grantee agrees to design a mitigation work plan (as that phrase is used by the United States Corps of Engineers in connection with clean water legislation and regulations) in connection with the Mitigation Purposes for the wetland and aquatic resources on the Protected Property (as such plan is finally approved and permitted, the "Mitigation Plan"). A copy of the Mitigation Plan will be provided to Grantor upon request.

(b) Wetland Mitigation Improvements. At its sole cost and expense, Grantee agrees to design, implement, construct, perform, install, manage, monitor, and, for the required period, maintain those certain wetland mitigation improvements which Grantee deems reasonably necessary to accomplish the Mitigation Purposes, in accordance with the Mitigation Plan and specifications developed or to be developed

by Grantee in its sole discretion for such purposes (collectively, the "Wetland Mitigation Improvements"). Grantor agrees that Grantee's obligations under this instrument (including this paragraph) are subject to Grantee's receipt of all necessary permits and governmental authority (including from the United States Corps of Engineers) and to changes in the parameters of the permits and/or authority expected by or granted to Grantee that adversely affect the cost or performance of Grantee's obligations hereunder, in Grantee's sole discretion. If the lack of such permits, or any increase in project costs, cause Grantee to terminate its obligations, this Conservation Easement shall be of no further effect.

(c) Maintenance of Wetland Mitigation Improvements. For a period of at least ten (10) years following completion of the Wetland Mitigation Improvements, Grantee shall be responsible for maintaining the Wetland Mitigation Improvements in good order and repair at Grantee's sole discretion and cost. The duration of Grantee's maintenance period shall not limit the perpetual duration of this Conservation Easement or of any other rights and obligations hereunder. Notwithstanding the foregoing, from the date of this Conservation Easement forward, Grantor, at Grantor's sole cost, shall be responsible for maintaining and repairing (1) any Livestock fencing necessary to keep Livestock off of the Property, regardless of whether or not the fencing was installed by Grantee as part of the Wetland Mitigation Improvements or whether it already existed; and (2) any Wetland Mitigation Improvement damaged by the intentional, reckless, or negligent act or omission of Grantor (or Grantor's invitee, tenant, licensee, or agent). Nothing herein is intended to obligate Grantor to maintain or repair the Wetland Mitigation Improvements.

3. Prohibited and Restricted Activities. Any activity on or use of the Property that is inconsistent with the Mitigation Purposes of this Conservation Easement or any applicable law and that is not otherwise expressly retained by Grantor in this instrument is prohibited. Without limiting the foregoing, the following activities and uses are expressly prohibited:

(a) Water Quality Degradation. No activities causing or contributing to pollution or alteration of wetlands or other aquatic resources will be conducted, permitted, or allowed to continue on the Property. Furthermore, no activities that would materially adversely affect the water quality; that materially alter natural water levels or drainage, or that materially contribute to sedimentation; that materially alter hydrology or water flow, in, on, under or over the Property or into any surface waters adjacent thereto; or that may otherwise cause material soil degradation or erosion will be conducted, permitted, or allowed to continue. No diking, dredging, draining, piping, or other activity causing any alteration to wetlands or other aquatic resources will be conducted, permitted, or allowed to continue on the Property, except activities to restore natural hydrology, or wetland restoration, creation or enhancement, as permitted by state and other appropriate authorities. There shall be no material alteration or manipulation of the wetlands, creeks, ponds, and/or other water courses located on the Property. Disruption of natural drainage patterns and creation of artificial drainage patterns on the Property is prohibited.

(b) Structures, Excavation, Fill and Roads. There shall be no constructing of any new temporary or permanent structure, improvement or facility on or above the Property, other than authorized Wetland Mitigation Improvements. There shall be no filling, excavating, dredging, mining or drilling, removal of topsoil, sand, gravel, rock, minerals, hydrocarbons or other materials, nor any building of new roads except as expressly allowed by other provisions of this instrument, or change in the topography or surface hydrology of the Property in any manner. All improvements to the Property by Grantor shall be subject to the prior written approval of the Grantee and shall not be inconsistent with the Mitigation Purposes.

(c) Vegetation. Without the express prior consent of Grantee (which consent may be withheld or conditioned in Grantee's sole discretion), Grantor shall not (1) cut or remove healthy, living trees, shrubs or plants on the Property; (2) use pesticides or biocides, except in connection with the reasonable treatment of exotic or invasive plant species; or (3) create fire breaks.

(d) Vehicles. Use of mechanized vehicles and/or horseback riding is permitted only on existing paths designated in the Mitigation Plan and only so long as such use does not jeopardize Wetland Mitigation Improvements. New roads, trails or pathways may be constructed only in accordance with the purposes of this Conservation Easement and with prior consent of Grantee (which consent may be withheld or conditioned in Grantee's sole discretion). Motorized recreational vehicles may not be operated off designated roads or trails on the Property. Any off-road or recreational vehicle use is prohibited other than as set forth herein.

(e) Agriculture. Grantor shall not use the Property for any Agricultural Uses (defined below). "Agricultural Uses" means (1) breeding, raising, boarding, pasturing and grazing Livestock of any nature and description, (2) row cropping or other production, harvesting, processing or storage of crops, and/or (3) haying. "Livestock" means cattle, horses, goats, sheep, llamas, chickens, turkeys and similar animals.

(f) Utilities. The installation of wires, lines, pipes, cables or other facilities providing electrical, gas, water, sewer, communications, or other utility services at, on, above or under the Property is prohibited. The installation of septic or other underground sanitary systems under the Property is prohibited.

4. Construction and Maintenance of the Wetland Mitigation Improvements. Nothing herein shall be interpreted or construed as prohibiting Owner or TWF from implementing, constructing, performing, installing, managing and maintaining the Wetland Mitigation Improvements on the Property.

5. Owner's Retained Rights to Protected Property.

(a) General Use. Grantor retains all rights accruing from the fee ownership of the Property, including the right to engage in, or permit others to engage in, the uses of the Property that are not inconsistent with this Conservation

Easement, the Mitigation Purposes, and the rights granted herein. These ownership rights include, but are not limited to, the right to exclude any member of the public from trespassing on the Property and the right to lease, sell or otherwise transfer the Property.

(b) Recreational and Educational Use. Grantor retains the right to use the Property for lawful passive and not-intrusive recreational uses, including, but not limited to, hunting, fishing, boating, camping, hiking, picnicking, social events, tours, nature study, interpretation and other educational programs, bird/wildlife watching, and other customary recreational uses related to preservation and appreciation of the Property's wetland, natural, scenic and/or open space attributes; provided, however, that Grantor shall: (i) minimize impacts to the Wetland Mitigation Improvements; (ii) not use motorized vehicles or boats in the Property except on designated roads and trails; and (iii) not construct any structures or improvements in connection with such recreational or educational uses (e.g., hunting blinds, observation decks, or pavilions) on the Property. Recreational or educational activities that adversely affect the Mitigation Purposes of this Conservation Easement are prohibited, including but not limited to use of the Property as a school, playground, library, golf course or other sport courts or fields, police or fire station, or public office building.

(c) Fences. Grantor may repair and replace existing fences outside of the Property for the purpose of reasonable access control and protection.

6. No Public Access. The granting of this Conservation Easement does not convey to the public the right to enter the Property for any purpose whatsoever.

7. Subdivision. Regardless of whether the Property is currently composed of one (1) or more contiguous or noncontiguous tax parcels, the Property shall be considered as one parcel for the purposes of this Conservation Easement and shall be retained in common ownership as though a single legal parcel. The subdivision of the Property, whether by physical or legal process, is prohibited. Any such subdivision of the Property, recording of a subdivision plan, partition of the Property, or any attempt to divide the Property without permission of the Grantee is prohibited. Without limiting the foregoing, the term "subdivision" shall not be limited by any statutory definition that limits the concept of subdivision. Subject to the foregoing, the Property may be transferred, encumbered, mortgaged or conveyed, or leased in whole or in part, and the provisions of this Conservation Easement shall continue to encumber the Property. Nothing in this Section shall be construed to prohibit the leasing of all or a portion of the Property, subject to the restrictions of this Conservation Easement.

8. Development Rights. Except as specifically reserved or permitted in this Conservation Easement, Grantor hereby grants, remises, releases and forever quitclaims to Grantee all development rights that are now or hereafter allocated to, implied, reserved or inherent in the Property, and the parties agree that such rights are terminated and extinguished, and may not be used on or transferred to any portion of the Property as it now or hereafter may be bounded or described.

9. Responsibilities of Grantor and Grantee Not Affected. Other than as specified herein, this Conservation Easement is not intended to impose any legal or other responsibility

on Grantee, or in any way to affect any existing obligation of Grantor as owner of the Property. Among other things, this shall apply to:

(a) Taxes. Grantor shall continue to be solely responsible for payment of all taxes and assessments levied against the Property. If Grantee is ever required to pay any taxes or assessments on its interest in the Property, Grantor will reimburse Grantee for the same.

(b) Upkeep and Maintenance. Grantor shall continue to be solely responsible for the general upkeep and maintenance of the Property, to the extent it may be required by law. Except as otherwise agreed herein concerning the Wetland Mitigation Improvements, Grantee shall have no obligation for the upkeep or maintenance of the Property.

(c) Liability and Indemnification. Except to the extent that the Property is owned by a governmental entity prohibited by law from providing the indemnity hereunder, if Grantee is ever required by a court to pay damages resulting from personal injury or property damage that occurs on the Property, Grantor shall indemnify and reimburse Grantee for these payments, as well as for reasonable attorneys' fees and other expenses of defending itself, unless Grantees or any of its agents have committed a deliberate act that is determined by a court to be the sole cause of the injury or damage. If Grantor is ever required by a court to pay damages resulting from personal injury or property damage that occurs on the Property as a result of a deliberate act of Grantee or any of its agents that is determined by a court to be the sole cause of the injury or damage, Grantee shall indemnify and reimburse Grantor for these payments, as well as for reasonable attorneys' fees and other expenses of defending Grantor.

10. Incorporation into Other Transfer Documents. Grantor agrees to incorporate by reference this Conservation Easement in any deed or other legal instrument whereby Grantor divests himself/herself/itself in any interest in all or a portion of the Property, including a leasehold interest. Grantor agrees to notify Grantee and the U.S. Army Corps of Engineers ("Corps") in writing of the names and addresses of any party to whom the Property or any part thereof is to be transferred at least sixty (60) days prior to the time said transfer is consummated. Such notification to the Corps shall be either serviced personally or sent by first class mail, postage prepaid, to:

United States Army Corps of Engineers
Chief, Regulatory Branch
3701 Bell Road
Nashville, TN 37214

The failure of Grantor to perform any act required by this paragraph shall not impair the validity of this Conservation Easement or limit its enforceability in any way.

11. Duration of Easement. This Conservation Easement shall be a servitude running with the land in perpetuity. Every provision of this Conservation Easement that is

enforceable against Grantor or Grantee shall also be enforceable against their personal representatives, heirs, successors, assigns, tenants, licensees, invitees, and agents.

12. Enforcement. Grantee shall have the right to prevent and correct violations of the terms of this Conservation Easement, and may exercise any remedy available at law or in equity, including specific performance and injunctive relief in order to prevent and correct such violations in accordance with the following:

(a) Remedies provided herein shall be cumulative, and Grantee shall have the right to seek the following remedies in addition to specific performance and injunctive relief if a court finds that a violation of this Conservation Easement exists or has occurred: (a) monetary damages, including damages for the loss of the Mitigation Purposes of this Conservation Easement; and (b) restoration of the Property to its condition prior to such violation, including removal of offending structures and restoration of Wetland Mitigation Improvements. If Grantor is found to have breached any of Grantor's obligations under this Conservation Easement, Owner shall reimburse Grantee for any costs or expenses incurred by Grantee in connection with such breach, including court costs and reasonable attorney's fees. The parties agree that Grantee shall be relieved of any requirement to post a bond in connection with any suit for injunctive relief under this Conservation Easement.

(b) No failure on the part of either party to enforce any term hereof shall discharge or invalidate such term or any other term hereof or affect the right of either party to enforce the same in the event of a subsequent breach or default.

(c) Grantee, and its employees and agents, shall have the right to enter the Property at reasonable times for the purpose of inspecting the Property to determine whether the Property is in compliance with the terms of this Conservation Easement; provided, however, that in cases where Grantee determines that immediate entry is required to prevent, terminate or mitigate a suspected or actual violation of this Conservation Easement that is likely to cause material or irreparable harm, such entry may be made at any time. This right of inspection does not include access to the interior of buildings and structures. Grantee agrees to indemnify and hold Grantor harmless of any injury resulting from any such entry. Nothing herein is intended to limit Grantee's right to access the Property consistent with the rights and obligations set forth above.

13. Transfer of Easement. This Easement is transferable, but Grantee shall give Grantor and the Corps at least sixty (60) days prior written notice of the transfer. If Grantee dissolves, ceases to exist, is unable or unwilling to carry out its responsibilities under this Conservation Easement, or no longer qualifies as a holder of conservation easements under Tennessee law, then it shall have the right to transfer without Grantor's prior approval the conservation easement created by this Conservation Easement, and the rights and obligations created hereunder, to any public agency or private nonprofit organization that, at the time of transfer, is a qualified holder of conservation easements under Tennessee law, but only if the agency or organization expressly agrees to assume the responsibility imposed on Grantee by this Easement. If Grantee ever dissolves, ceases to exist, or no longer qualifies as a holder, and a transfer has not been made pursuant to the foregoing sentence, a court with jurisdiction shall

transfer this conservation easement, and the rights and obligations created hereunder, to another qualified organization having similar purposes that agrees to assume the responsibility. Upon such transfer pursuant to this Section, all records, plans and documents with respect to the Conservation Easement and the Property in Grantee's possession shall be provided to such qualified transferee organization to help provide it with an understanding of the Property, the operations thereon, and the conservation easement.

14. Eminent Domain. If all or any part of the Property is taken under the power of eminent domain by public, corporate or other authority, or otherwise acquired by such authority through a purchase in lieu of a taking, Grantor and Grantee shall join in appropriate proceedings at the time of such taking to recover the full value of the interests in the Property subject to the taking and all incidental or direct damages resulting from the taking. All expenses, including attorneys' fees, reasonably incurred by the parties in connection with such taking shall be paid out of the recovered proceeds. The respective rights of Grantor and Grantee set forth in this paragraph shall be in addition to, and not in limitation of, any rights they may have at common law with respect to a modification or termination of this Conservation Easement by reason of the exercise of powers of eminent domain or a purchase in lieu.

15. Effectiveness of Conservation Easement; Amendments. This Conservation Easement shall be effective upon execution and enforceable against third parties from and after the time it is recorded with the Register's Office of the county in which the Property is located. Grantee shall record this instrument in a timely fashion, and may re-record it at any time as may be required to preserve its rights under this Conservation Easement. This Conservation Easement may be amended only with the written consent of Grantee and Grantor. Any such amendment shall be consistent with the purposes as stated hereinabove. Additionally, any such amendment shall be effective and enforceable as to third parties from and after the time that such amendment is recorded with the Register's Office of the county in which the Property is located.

16. Interpretation; Captions; Severability. This Conservation Easement shall be interpreted under the laws of the State of Tennessee, resolving any ambiguities and questions of the validity of specific provisions so as to give maximum effect to its conservation purposes and Mitigation Purposes. The captions in this Conservation Easement are for reference purposes only and shall not define, limit or expand the meaning or application of any term, paragraph or section contained herein. This Conservation Easement is severable, such that the invalidity, illegality or unenforceability of any term or provision contained herein shall not affect the validity, legality or enforceability of the other provisions in this Conservation Easement.

17. Notices. Any notices required by this Conservation Easement shall be in writing and shall be personally delivered or sent by first class mail, return receipt requested, or by nationally recognized and reputable overnight courier service maintaining records of receipt, to Grantee and Grantor respectively. Any such properly given notice shall be effective upon receipt if mailed, or upon the following business day if sent by overnight courier service. All notices shall be provided to the following addresses, unless a party has been notified by the other of a change of address:

To Grantor: Lisa and Johnnie Williams
3135 Fowler Montgomery Road
Cookeville, TN 38506

To Grantee: Tennessee Wildlife Federation
300 Orlando Avenue
Nashville, TN 37209-3200

In the event that a party to this Conservation Easement shall transfer such party's interest in the Property or under this Conservation Easement by conveyance, distribution, operation of law or otherwise, the transferee of such interest shall provide the nontransferring party with written notice of the change of address to which notice is to be sent hereunder.

18. Environmental Matters. Owner has no actual knowledge of a material release or threatened release of hazardous substances or wastes on the Property during Grantor's ownership of the Property, or the Property's use as a landfill or dump. Grantor hereby promises to defend and indemnify Grantee against all litigation, claims, demands, penalties and damages, including reasonable attorneys' fees, arising from or connected with any release of hazardous substances or waste, use of the Property as a landfill or dump, or violation of any federal, state or local environmental laws.

19. Owner's Representations. Grantor represents, warrants and covenants to Grantee that: (i) Grantor is the sole owner and is seized of the Property in fee simple and has good right to grant and convey the aforesaid Conservation Easement; (ii) Grantor has provided to Grantee all deeds of trust affecting the Property or which will affect the Property prior to the recording of this Conservation Easement; (iii) the performance of Grantor's obligations under this Conservation Easement are consistent with and not in violation of, and will not create any adverse condition under, any contract, agreement or other instrument to which Grantor is a party, any judicial order or judgment of any nature by which Grantor is bound; (iv) there is legal access to the Property; and (v) the Grantee shall have the use of and enjoy all of the benefits derived from and arising out of the aforesaid Conservation Easement. To the extent that Grantor is a corporate entity, Grantor further represents, warrants and covenants to and with Grantee that (i) Grantor is a corporation duly organized and validly existing under the laws of the State of Tennessee; and (ii) the execution and delivery of this Conservation Easement, and the performance of Grantor's obligations under this Conservation Easement, have been duly authorized by all requisite corporate action are consistent with and not in violation of, and will not create any adverse condition under the organizational documents of Grantor.

20. Acceptance. As evidenced by the signature of Grantee's duly authorized officer affixed hereto, Grantee hereby accepts without reservation the rights and responsibilities conveyed by this Conservation Easement.

21. Counterpart Execution. This Conservation Easement may be simultaneously executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

22. Conveyance. This Conservation Easement and the conservation easement herein described are quitclaimed subject to such limitations, covenants and restrictions as may affect the Property, but the parties hereto specifically agree to comply with all of the terms and provisions herein contained.

23. Consistent with Other Laws. This Conservation Easement shall be construed to promote the purposes of the Conservation Agreement Act of 1981 and the purposes described in this Conservation Easement. The terms of this Conservation Easement do not replace, abrogate or otherwise set aside any local, state or federal laws, requirements or restrictions imposing limitations on the use of the Property.

24. Exhibits. The following exhibits are hereby made a part of this Conservation Easement:

(a) Exhibit A. Description of the Property, including a plat map and/or survey drawing, consisting of two pages.

The parties acknowledge that these exhibits reflect the existing uses of and structures on the Property as of the date of this Conservation Easement.

TO HAVE AND TO HOLD unto Grantee, forever. The covenants agreed to and the terms, conditions, and restrictions imposed as aforesaid shall be binding upon Grantor, and Grantor's survivors, agents, personal representatives, heirs, successors, assigns, and shall continue as a servitude running in perpetuity with the Property.

[Signature page follows.]

IN WITNESS WHEREOF, Grantor and Grantee have executed this Conservation Easement as of the date first set forth above.

GRANTOR:

LISA WILLIAMS

STATE OF TENNESSEE)
COUNTY OF _____)

Before me, the undersigned, a Notary Public of the State and County aforesaid, personally appeared _____ with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who executed the foregoing instrument for the purpose therein contained.

Witness my hand and notarial seal this ____day of _____, 20__.

Notary Public
My commission expires: _____

[Affix Official Seal]

JOHNNIE WILLIAMS

STATE OF TENNESSEE)
COUNTY OF _____)

Before me, the undersigned, a Notary Public of the State and County aforesaid, personally appeared _____ with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who executed the foregoing instrument for the purpose therein contained.

Witness my hand and notarial seal this ____day of _____, 20__.

Notary Public
My commission expires: _____

[Affix Official Seal]

GRANTEE:

Tennessee Wildlife Federation, Inc.

By: _____

Print Name: _____

Title: _____

STATE OF TENNESSEE)
COUNTY OF _____)

Before me, the undersigned, a Notary Public of the State and County aforesaid, personally appeared _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath acknowledged himself to be the _____ of the Tennessee Wildlife Federation, a Tennessee non-profit corporation, and that he/she in such capacity, executed the foregoing instrument for the purpose therein contained by signing the name of the corporation by himself as such officer or in such capacity.

Witness my hand and notarial seal this ____ day of _____, 20____

Notary Public
My commission expires: _____

[Affix Official Seal]

STATE OF TENNESSEE)
COUNTY OF _____)

The actual consideration of this transfer is **\$67,000.**

Affiant

Subscribed and sworn to before me,
this _____ day of _____ 20____

NOTARY PUBLIC

My Commission Expires: _____

EXHIBIT A

PROPERTY DESCRIPTION

Tract 1:

Situated in the State of TENNESSEE

COMMENCING AT A FOUND IRON ROD LOCATED IN THE NORTHEAST CORNER OF THE SUBJECT PROPERTY, SAID IRON ROD BEING LOCATED IN THE NORTHERN RIGHT OF WAY OF FOWLER MONTGOMERY ROAD. THENCE: N87°02'12"W, 827.72' TO THE CORNER OF WETLAND MITIGATION AREA 2. THENCE; N87°02'10"W, 465.31' TO THE CORNER OF A 75' TVA POWERLINE EASEMENT. THENCE; N87°02'10"W, 82.34' TO THE TRUE POINT OF BEGINNING, ALSO BEING LOCATED IN THE SOUTHERLY LINE OF SHERRELL (D.B. 733 PAGE 357). THENCE; ALONG THE WESTERLY LINE OF THE 75' POWERLINE EASEMENT S27°16'37"W, PASSING AN IRON PIN SET IN A NEW FENCE LINE AT 20.7' FOR A TOTAL DISTANCE OF 852.32' TO A POINT IN THE NORTHERLY LINE OF BOHANNON (D.B. 790 PAGE 488). THENCE; WITH THE NORTHERN LINE OF BOHANNON N83°15'18"W, 226.94' TO A POINT IN THE CENTERLINE OF CANE CREEK, ALSO BEING IN THE EASTERLY LINE OF WATERS (D.B. 698 PAGE 766). THENCE; WITH THE CENTERLINE OF CANE CREEK N04°15'36"E, 125.34' TO A POINT. THENCE; N49°59'43"E, 105.00' TO A POINT. THENCE; N53°34'22"W, 158.80' TO A POINT. THENCE; N39°20'47"W, 58.00' TO A POINT LOCATED IN THE EASTERLY LINE OF HOLMES (D.B. 336 PAGE 271). THENCE; CONTINUING WITH THE CENTERLINE OF CANE CREEK N63°47'19"E, 123.28' TO A POINT. THENCE; N22°39'41"E, 138.75' TO A POINT. THENCE; S87°29'21"E, 39.93' TO A POINT. N23°56'37"E, 188.00' TO A POINT. THENCE; S70°13'21"E, 121.43' TO A POINT. THENCE; N31°00'12"E, 116.67' TO A POINT LOCATED ON THE SOUTHERLY LINE OF SHERRELL (D.B. 733 PAGE 357). THENCE; WITH THE LINE OF SHERRELL S87°02'10"E, 236.49' TO THE POINT OF BEGINNING, CONTAINING 5.929 ACRES AS SURVEYED BY CEC INC, H. WADE LOVIN RLS# 2151 AND SHOWN ON SURVEY DATED 09/15/2016 BEARING PROJECT # 163-028.

Tract 2:

Situated in the State of TENNESSEE

COMMENCING AT A FOUND IRON ROD LOCATED IN THE NORTHEAST CORNER OF THE SUBJECT PROPERTY, SAID IRON ROD BEING LOCATED ON THE NORTHERN RIGHT OF WAY OF FOWLER MONTGOMERY ROAD. THENCE: N87°02'12"W, 827.72' TO THE TRUE POINT OF BEGINNING OF WETLAND MITIGATION AREA 2, SAID

POINT ALSO BEING IN THE SOUTHERLY LINE OF SHERRELL (D.B. 733 PAGE 357). THENCE; WITH THE LINE OF WETLAND MITIGATION AREA 2 S33°37'09"W, PASSING AN IRON PIN SET IN A NEW FENCE LINE AT 51.7' FOR A TOTAL DISTANCE OF 576.56' TO AN IRON PIN SET. THENCE; S64°21'57"W, 597.55' TO AN IRON PIN SET IN THE NORTHERLY LINE OF BOHANNON (D.B. 790 PAGE 488), SAID POINT ALSO BEING LOCATED ON THE EASTERLY LINE OF A 75' TVA POWERLINE EASEMENT. THENCE; WITH THE COMMON LINE OF WETLAND MITIGATION AREA 2 AND THE 75' POWERLINE EASEMENT N27°16'37"E, PASSING AN IRON PIN SET IN A NEW FENCE LINE AT 839.22' FOR A TOTAL DISTANCE OF 858.12' TO A POINT LOCATED IN THE SOUTHERLY LINE OF SHERRELL (D.B. 733 PAGE 357). THENCE; WITH THE COMMON LINE OF SHERRELL AND WETLAND MITIGATION AREA 2 S87°02'10"E, 465.31' TO THE POINT OF BEGINNING, CONTAINING 6.199 ACRES AS SURVEYED BY CEC INC, H. WADE LOVIN RLS# 2151 AND SHOWN ON SURVEY DATED 09/15/2016 BEARING PROJECT # 163-028.

Appendix 2:

Wetland Delineation Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Williams Property City/County: Cookeville/Putnam Sampling Date: 1/29/2016
 Applicant/Owner: Mr. Williams State: TN Sampling Point: Plot 1
 Investigator(s): Chris Fleming / Dave Cour Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): <3
 Subregion (LRR or MLRA): LRR Lat: 36.120075 Long: -85.576416 Datum: WGS84
 Soil Map Unit Name: Linside Silt Loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation ☒, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ☒
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="radio"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No _____
Hydric Soil Present?	Yes <input checked="" type="radio"/> No _____	
Wetland Hydrology Present?	Yes <input checked="" type="radio"/> No _____	
Remarks: This is an agricultural pasture that has recently been left fallow; soils have been tilled		

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>15</u> Saturation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>11</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Saturated soils and several primary and secondary indicators		

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: **Plot 1**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																	
1. _____	_____	_____	_____																																																	
2. _____	_____	_____	_____																																																	
3. _____	_____	_____	_____																																																	
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				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u></td> <td>(A) <u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = _____	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u>	(A) <u>0</u> (B)																																		
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				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																																
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				Herb Stratum (Plot size: <u>5</u>) <table style="width: 100%;"> <tr> <td>1. <u>Schenodorus arundinaceus</u></td> <td><u>15</u></td> <td><input checked="" type="checkbox"/></td> <td>FACU</td> </tr> <tr> <td>2. <u>Juncus effusus</u></td> <td><u>15</u></td> <td><input checked="" type="checkbox"/></td> <td>FACW</td> </tr> <tr> <td>3. <u>Pontentilla simplex</u></td> <td><u>15</u></td> <td><input checked="" type="checkbox"/></td> <td>FACU</td> </tr> <tr> <td>4. <u>Vernonia gigantea</u></td> <td><u>10</u></td> <td><input checked="" type="checkbox"/></td> <td>FAC</td> </tr> <tr> <td>5. <u>Juncus tenuis</u></td> <td><u>10</u></td> <td><input checked="" type="checkbox"/></td> <td>FAC</td> </tr> <tr> <td>6. <u>Diodia virginiana</u></td> <td><u>10</u></td> <td><input checked="" type="checkbox"/></td> <td>FACW</td> </tr> <tr> <td>7. <u>Carex frankii</u></td> <td><u>10</u></td> <td><input checked="" type="checkbox"/></td> <td>OBL</td> </tr> <tr> <td>8. <u>Verbena urticifolia</u></td> <td><u>5</u></td> <td>_____</td> <td>FAC</td> </tr> <tr> <td>9. <u>Trifolium repens</u></td> <td><u>5</u></td> <td>_____</td> <td>FACU</td> </tr> <tr> <td>10. <u>Daucus carota</u></td> <td><u>5</u></td> <td>_____</td> <td>UPL</td> </tr> <tr><td>11. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>12. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> </table>	1. <u>Schenodorus arundinaceus</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU	2. <u>Juncus effusus</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACW	3. <u>Pontentilla simplex</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU	4. <u>Vernonia gigantea</u>	<u>10</u>	<input checked="" type="checkbox"/>	FAC	5. <u>Juncus tenuis</u>	<u>10</u>	<input checked="" type="checkbox"/>	FAC	6. <u>Diodia virginiana</u>	<u>10</u>	<input checked="" type="checkbox"/>	FACW	7. <u>Carex frankii</u>	<u>10</u>	<input checked="" type="checkbox"/>	OBL	8. <u>Verbena urticifolia</u>	<u>5</u>	_____	FAC	9. <u>Trifolium repens</u>	<u>5</u>	_____	FACU	10. <u>Daucus carota</u>	<u>5</u>	_____	UPL	11. _____	_____	_____	_____	12. _____	_____	_____	_____
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				Remarks: (Include photo numbers here or on a separate sheet.) Dense moss layer on surface of soil. Vegetation disturbed from historic agriculture. Vegetation still met the dominance test.																																																

Sampling Point: Plot 1

Sampling Point: Plot 1

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Williams Property City/County: Cookeville/Putnam Sampling Date: 1/29/2016
 Applicant/Owner: Mr. Williams State: TN Sampling Point: Plot 2
 Investigator(s): Chris Fleming / Dave Cour Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): concave Slope (%): <3
 Subregion (LRR or MLRA): LRR Lat: 36.119343 Long: -85.576643 Datum: WGS84
 Soil Map Unit Name: Melvin Silt Loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation ☒, Soil ☒, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No _____
Hydric Soil Present? Yes <input checked="" type="radio"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="radio"/> No _____	
Remarks: This is an agricultural pasture that has recently been left fallow; soils have been tilled; appears to be developing into wet meadow	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input checked="" type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>7</u> Saturation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Soils very saturated and shallow water table observed		

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: **Plot 2**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																	
1. _____	_____	_____	_____																																																	
2. _____	_____	_____	_____																																																	
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				Herb Stratum (Plot size: <u>5</u>) <table style="width: 100%;"> <tr> <td>1. <u>Juncus effusus</u></td> <td><u>25</u></td> <td><input checked="" type="checkbox"/></td> <td>FACW</td> </tr> <tr> <td>2. <u>Schedonorus pratensis</u></td> <td><u>20</u></td> <td><input checked="" type="checkbox"/></td> <td>FACU</td> </tr> <tr> <td>3. <u>Andropogon virginicus</u></td> <td><u>15</u></td> <td><input checked="" type="checkbox"/></td> <td>FACU</td> </tr> <tr> <td>4. <u>Ranunculus sarduous</u></td> <td><u>15</u></td> <td><input checked="" type="checkbox"/></td> <td>UPL</td> </tr> <tr> <td>5. <u>Juncus tenuis</u></td> <td><u>5</u></td> <td>_____</td> <td>FAC</td> </tr> <tr> <td>6. <u>Kyllinga pumila</u></td> <td><u>5</u></td> <td>_____</td> <td>FACW</td> </tr> <tr> <td>7. <u>Trifolium pratense</u></td> <td><u>5</u></td> <td>_____</td> <td>FACU</td> </tr> <tr> <td>8. <u>Penthorum sedoides</u></td> <td><u>5</u></td> <td>_____</td> <td>OBL</td> </tr> <tr> <td>9. <u>Carex sp.</u></td> <td><u>5</u></td> <td>_____</td> <td>FAC</td> </tr> <tr><td>10. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>11. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>12. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> </table>	1. <u>Juncus effusus</u>	<u>25</u>	<input checked="" type="checkbox"/>	FACW	2. <u>Schedonorus pratensis</u>	<u>20</u>	<input checked="" type="checkbox"/>	FACU	3. <u>Andropogon virginicus</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU	4. <u>Ranunculus sarduous</u>	<u>15</u>	<input checked="" type="checkbox"/>	UPL	5. <u>Juncus tenuis</u>	<u>5</u>	_____	FAC	6. <u>Kyllinga pumila</u>	<u>5</u>	_____	FACW	7. <u>Trifolium pratense</u>	<u>5</u>	_____	FACU	8. <u>Penthorum sedoides</u>	<u>5</u>	_____	OBL	9. <u>Carex sp.</u>	<u>5</u>	_____	FAC	10. _____	_____	_____	_____	11. _____	_____	_____	_____	12. _____	_____	_____	_____
1. <u>Juncus effusus</u>	<u>25</u>	<input checked="" type="checkbox"/>	FACW																																																	
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1. _____	_____	_____	_____																																																	
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5. _____	_____	_____	_____																																																	
6. _____	_____	_____	_____																																																	
				0 = Total Cover																																																
Remarks: (Include photo numbers here or on a separate sheet.) Met dominance test.																																																				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Williams Property City/County: Cookeville/Putnam Sampling Date: 1/29/2016
 Applicant/Owner: Mr. Williams State: TN Sampling Point: Plot 3
 Investigator(s): Chris Fleming / Dave Cour Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): <5
 Subregion (LRR or MLRA): LRR Lat: 36.118854 Long: -85.575855 Datum: WGS84
 Soil Map Unit Name: Melvin Silt Loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="radio"/>
Hydric Soil Present? Yes _____ No <input checked="" type="radio"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="radio"/>	
Remarks: This is a slightly elevated slope above the agricultural field; no wetland characteristics documented.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ Saturation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No hydrology indicators observed		

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: **Plot 3**

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____																		
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B)														
				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>75</u></td> <td>x 4 = <u>300</u></td> </tr> <tr> <td>UPL species <u>10</u></td> <td>x 5 = <u>50</u></td> </tr> <tr> <td>Column Totals: <u>90</u> (A)</td> <td><u>365</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.05</u>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>75</u>	x 4 = <u>300</u>	UPL species <u>10</u>	x 5 = <u>50</u>	Column Totals: <u>90</u> (A)	<u>365</u> (B)
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OBL species _____	x 1 = <u>0</u>																	
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FACU species <u>75</u>	x 4 = <u>300</u>																	
UPL species <u>10</u>	x 5 = <u>50</u>																	
Column Totals: <u>90</u> (A)	<u>365</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15</u>)																		
1. <u>Ranunculus sarduous</u>	<u>20</u>	<input checked="" type="checkbox"/>	FACU															
2. <u>Schedonorus pratensis</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU															
3. <u>Andropogon virginicus</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU															
4. <u>Trifolium pratense</u>	<u>15</u>	<input checked="" type="checkbox"/>	FACU															
5. <u>Plantago lanceolata</u>	<u>10</u>		UPL															
6. <u>Perilla frutescens</u>	<u>5</u>		FACU															
7. <u>Carex sp.</u>	<u>5</u>		FAC															
8. <u>Cerastium vulgare</u>	<u>5</u>		FACU															
9. <u>Cirsium sp.</u>	<u>5</u>																	
10. <u>Graminoid</u>	<u>5</u>																	
				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5</u>)				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
1. _____																		
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30</u>)																		
1. _____																		
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
				Hydrophytic Vegetation Present? Yes <u> </u> No <u>●</u>														
Remarks: (Include photo numbers here or on a separate sheet.) Dominated by upland species																		

Sampling Point: Plot 3

[illegible]²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
 (MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
 (MLRA 136, 147)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

No hydric soil indicators

Appendix 3:

Site Photos

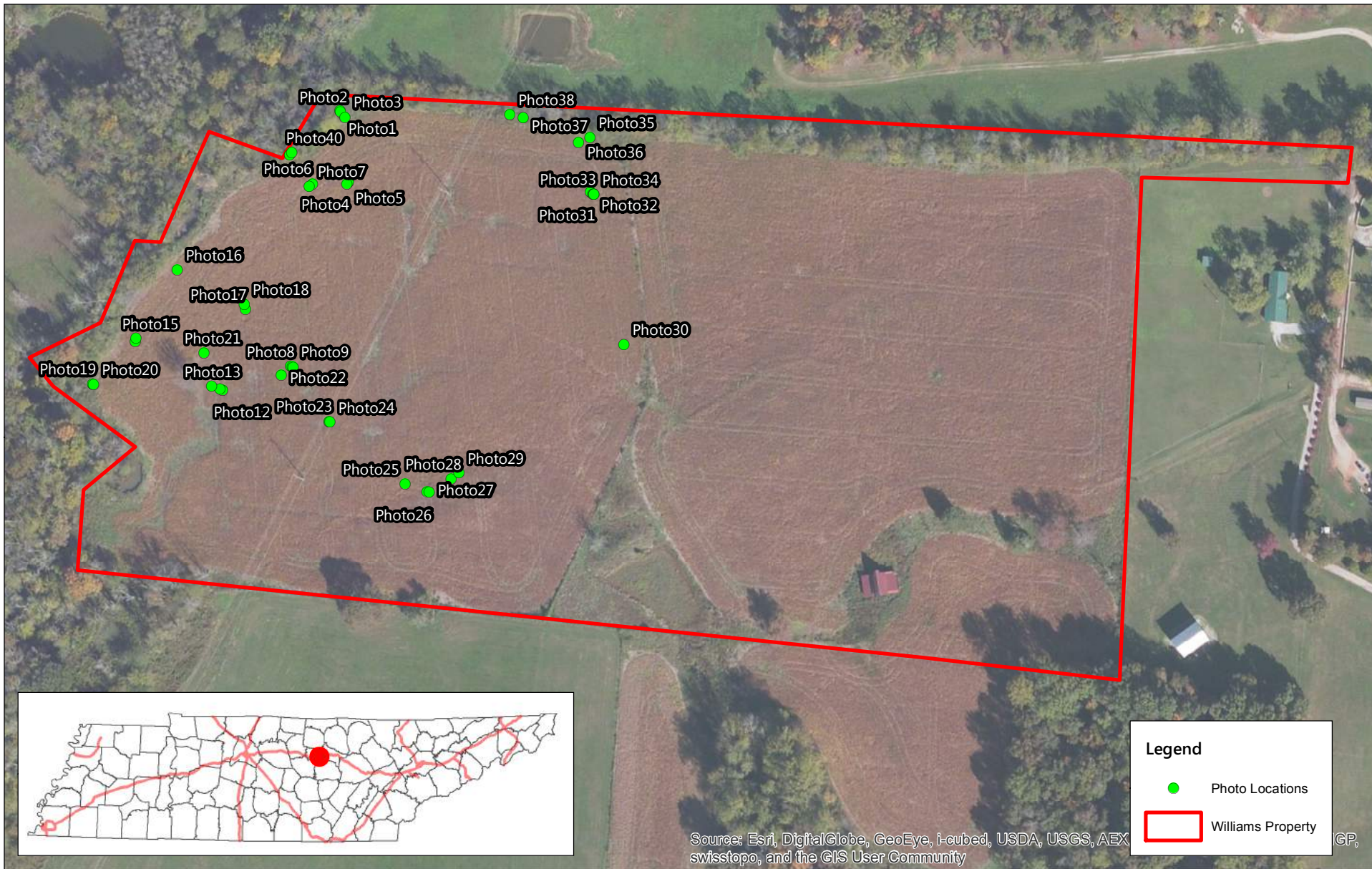
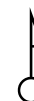


Photo Locations
Proposed Williams Mitigation Site
Cookeville, Putnam County, TN

BDY NATURAL SCIENCES CONSULTANTS
2607 Westwood Drive, Nashville, Tennessee | 615.460.9797 | www.bdy-inc.com

0 100 200 Feet



Date: 9/23/2016
NAD 1983 StatePlane Tennessee FIPS 4100 Feet
Map Center: 36.119060, -85.574468
Prepared For:
Prepared By:
Sources: ENTER SOURCES HERE

Williams Mitigation Site Photo Page



1/29/2016 3:24:08 PM (-6.0 hrs) Dir=W Lat=36.12047 Lon=-85.57632 Alt=983ft MSL WGS 1984

Photo 1: View of tributary in backwater area.



1/29/2016 3:24:14 PM (-6.0 hrs) Dir=WNW Lat=36.12046 Lon=-85.57632 Alt=983ft MSL WGS 1984

Photo 2: View of tributary in backwater area.

Williams Mitigation Site Photo Page



Photo 3: View of wetland mitigation area, facing southeast



Photo 4: View of wetland mitigation area, facing south-southeast

Williams Mitigation Site Photo Page



1/29/2016 3:41:49 PM (-6.0 hrs) Dir=WSW Lat=36.12015 Lon=-85.57628 Alt=978ft MSL WGS 1984

Photo 5: View of wetland mitigation area, facing south.



1/29/2016 3:43:13 PM (-6.0 hrs) Dir=SSE Lat=36.12015 Lon=-85.57647 Alt=978ft MSL WGS 1984

Photo 6: View of vegetation in western portion of wetland mitigation area.

Williams Mitigation Site Photo Page



Photo 7: View of wetland mitigation area, facing east.



Photo 8: View of wetland mitigation area, facing east.

Williams Mitigation Site Photo Page



Photo 9: View of wetland mitigation area, facing south.



Photo 10: View of wetland mitigation area, facing west.

Williams Mitigation Site Photo Page



Photo 11: View of wetland mitigation area, facing south-southeast



Photo 12: View of wetland mitigation area, facing south.

Williams Mitigation Site Photo Page



Photo 13: View of wetland mitigation area, facing east.



Photo 14: View of wetland mitigation area, facing east.

Williams Mitigation Site Photo Page



1/29/2016 4:10:46 PM (-6.0 hrs) Dir=SSE Lat=36.11949 Lon=-85.5774 Alt=964ft MSL WGS 1984

Photo 15: View of wetland mitigation area, facing south.



1/29/2016 4:11:32 PM (-6.0 hrs) Dir=N Lat=36.11979 Lon=-85.57718 Alt=966ft MSL WGS 1984

Photo 16: View of Cane Creek near mitigation area, facing north.



1/29/2016 4:12:34 PM (-6.0 hrs) Dir=S Lat=36.11962 Lon=-85.57682 Alt=964ft MSL WGS 1984

Photo 17: View of vegetation in wetland mitigation area, facing south.



1/29/2016 4:12:40 PM (-6.0 hrs) Dir=SE Lat=36.11964 Lon=-85.57683 Alt=964ft MSL WGS 1984

Photo 18: View of vegetation in wetland mitigation area, facing southeast.

Williams Mitigation Site Photo Page



Photo 19: View of northern boundary of wetland mitigation area, facing east.



Photo 20: View of wetland mitigation area, facing east-southeast.



Photo 21: View of wetland mitigation area, facing north-northeast



Photo 22: View of soils in wetland mitigation area.



Photo 23: View of soils in wetland mitigation area.



Photo 24: View of soils in wetland mitigation area.



Photo 25: View of wetland mitigation area, facing northwest.



Photo 26: View of soils in wetland mitigation area.



Photo 27: View of soils in wetland mitigation area.



Photo 28: View of wetland mitigation area, facing east.

Williams Mitigation Site Photo Page



Photo 29: View of wetland mitigation area, facing east-northeast.



Photo 30: View of wetland mitigation area, facing north.



Photo 31: View of saturation in wetland mitigation area.



Photo 32: View of vegetation in wetland mitigation area, facing southeast.



Photo 33: View of vegetation in wetland mitigation area, facing south-southeast



Photo 34: View of wetland mitigation area, facing southeast



Photo 35: View of inundation in wetland mitigation area, facing southwest.



Photo 36: View of inundation in wetland mitigation area, facing west.

Williams Mitigation Site Photo Page



Photo 37: View of flow entering property in wetland mitigation area, facing northwest.



Photo 38: View of flow entering property in wetland mitigation area, facing north.



1/29/2016 5:09:10 PM (-6.0 hrs) Dir=NNE Lat=36.12028 Lon=-85.57658 Alt=984ft MSL WGS 1984

Photo 39: View of tributary, facing north-northeast



1/29/2016 5:09:54 PM (-6.0 hrs) Dir=NE Lat=36.12029 Lon=-85.57657 Alt=978ft MSL WGS 1984

Photo 40: View of beaver dam on tributary, facing northeast



Photo 41: View of soils in wetland mitigation area.



Photo 42: View of soils in wetland mitigation area.

Appendix 4:
NRCS Custom Soil Report



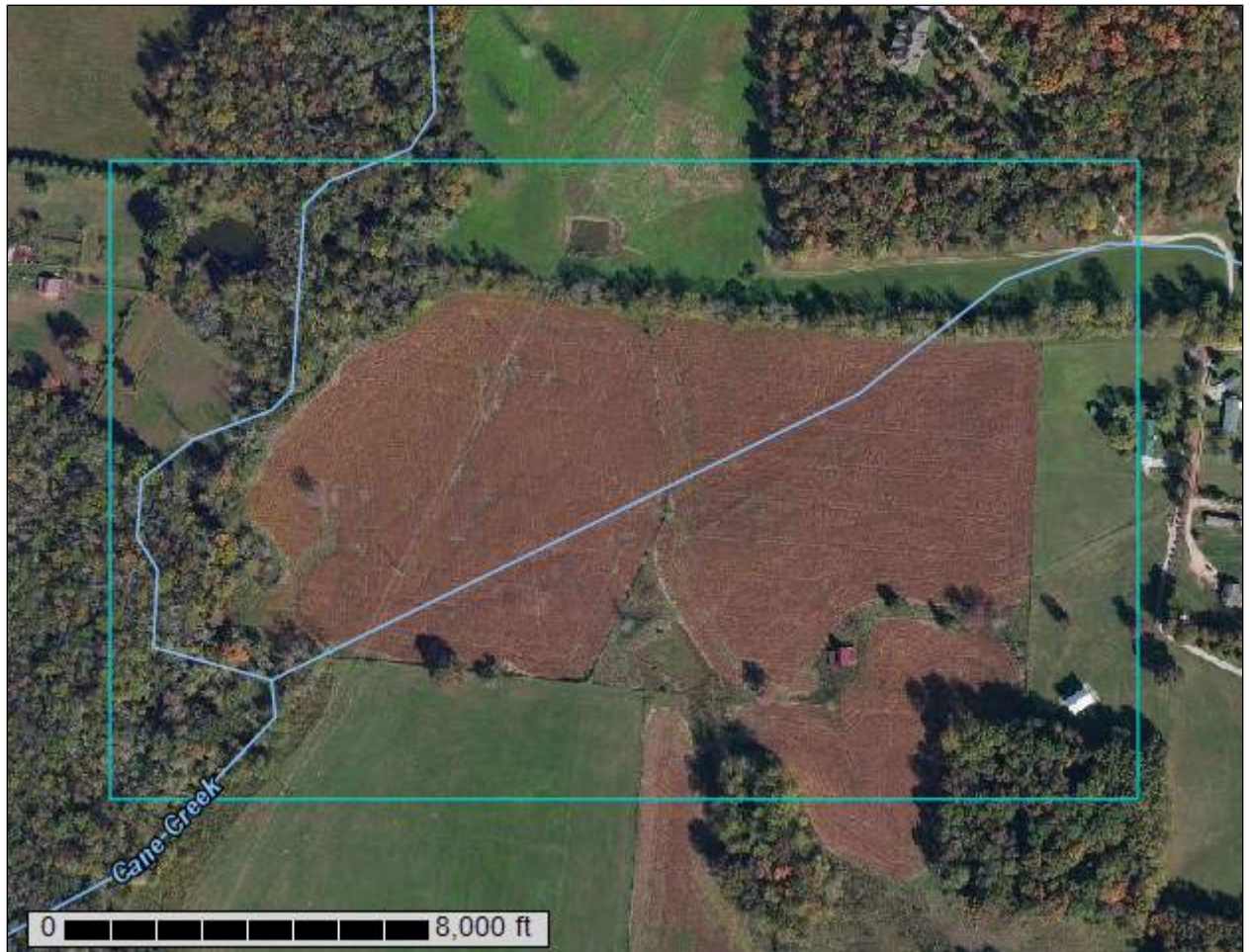
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Putnam County and Parts of White County, Tennessee



February 16, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

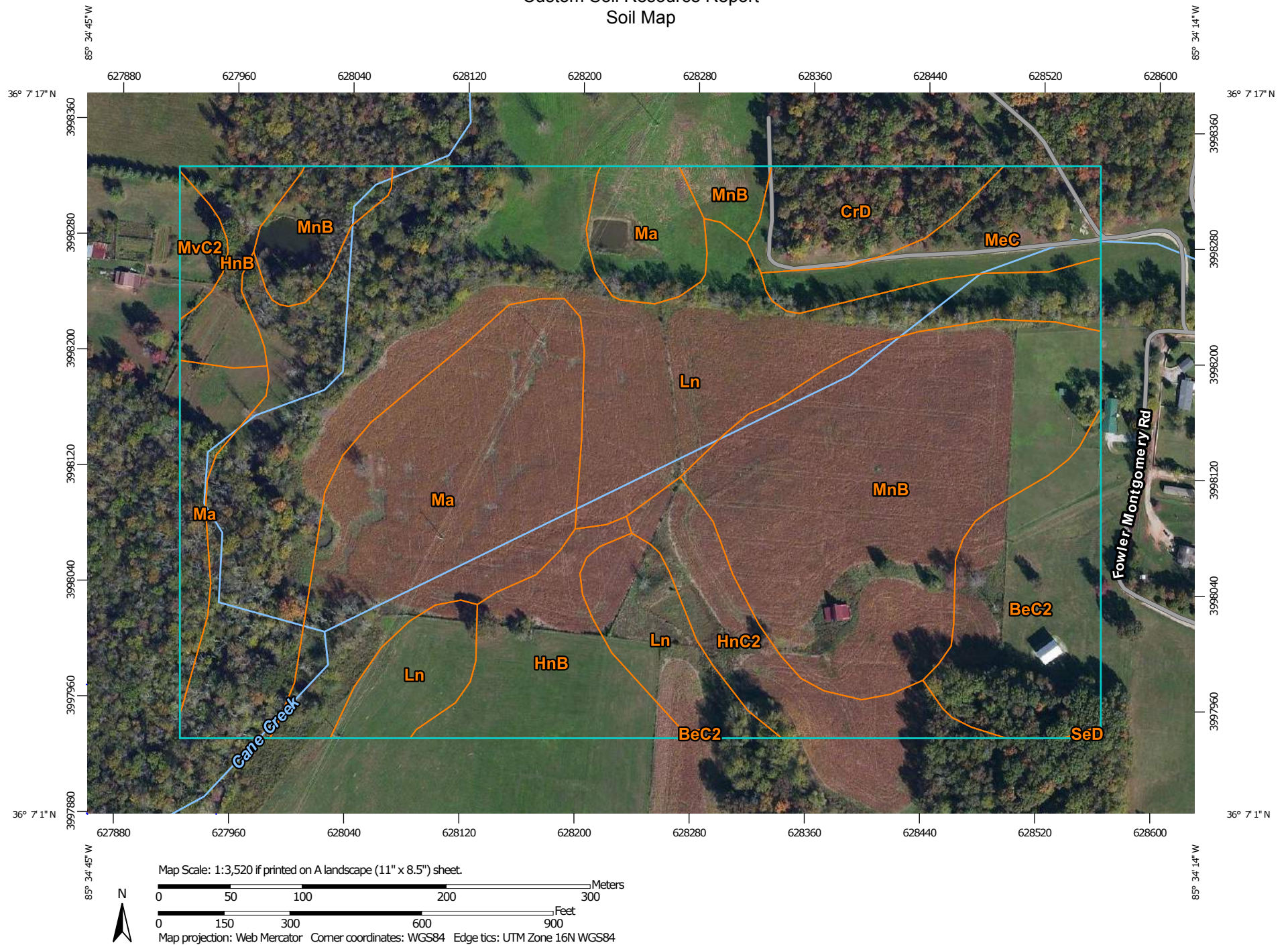
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole

 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Putnam County and Parts of White County, Tennessee
Survey Area Data: Version 7, Sep 16, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2011—Oct 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Putnam County and Parts of White County, Tennessee (TN610)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeC2	Bewleyville silt loam, 5 to 12 percent slopes, eroded	4.5	7.2%
CrD	Christian silt loam, 12 to 20 percent slopes	2.3	3.6%
HnB	Holston loam, 2 to 5 percent slopes	4.7	7.4%
HnC2	Holston loam, 5 to 12 percent slopes, eroded	2.8	4.5%
Ln	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	20.8	33.2%
Ma	Melvin silt loam	11.4	18.2%
MeC	Minvale silt loam, 5 to 12 percent slopes	2.6	4.1%
MnB	Monongahela silt loam, 2 to 5 percent slopes	13.2	20.9%
MvC2	Mountview silt loam, 5 to 12 percent slopes, eroded	0.6	0.9%
SeD	Sengtown gravelly silt loam, 12 to 20 percent slopes	0.0	0.0%
Totals for Area of Interest		62.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties

and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Putnam County and Parts of White County, Tennessee

BeC2—Bewleyville silt loam, 5 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2mgx9
Elevation: 800 to 1,200 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 180 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Bewleyville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bewleyville

Setting

Landform: Hillslopes
Landform position (three-dimensional): Crest
Parent material: Loess over clayey or loamy alluvium

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silty clay loam
H3 - 28 to 72 inches: clay

Properties and qualities

Slope: 5 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

CrD—Christian silt loam, 12 to 20 percent slopes

Map Unit Setting

National map unit symbol: 2mgy0
Mean annual precipitation: 46 to 60 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 190 to 200 days

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Farmland classification: Not prime farmland

Map Unit Composition

Christian and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Christian

Setting

Landform: Hillslopes

Landform position (three-dimensional): Side slope

Parent material: Clayey residuum weathered from limestone, sandstone, and shale

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 10 inches: silty clay loam

H3 - 10 to 58 inches: clay

Cr4 - 58 to 68 inches: bedrock

Properties and qualities

Slope: 12 to 20 percent

Depth to restrictive feature: 39 to 79 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

HnB—Holston loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2mgyp

Elevation: 900 to 1,800 feet

Mean annual precipitation: 45 to 55 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 190 to 205 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Holston and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holston

Setting

Landform: Stream terraces

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Landform position (three-dimensional): Tread

Parent material: Loamy alluvium and/or colluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 8 inches: loam

H2 - 8 to 40 inches: clay loam

H3 - 40 to 75 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

HnC2—Holston loam, 5 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2mgyq

Elevation: 900 to 1,800 feet

Mean annual precipitation: 45 to 55 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 190 to 205 days

Farmland classification: Not prime farmland

Map Unit Composition

Holston and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holston

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Parent material: Loamy alluvium and/or colluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 6 inches: loam

H2 - 6 to 40 inches: clay loam

H3 - 40 to 75 inches: clay loam

Properties and qualities

Slope: 5 to 12 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ln—Lindell silt loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2td2y

Elevation: 500 to 850 feet

Mean annual precipitation: 48 to 58 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 190 to 230 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Lindell and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lindell

Setting

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Fine-loamy alluvium derived from limestone and siltstone

Typical profile

Ap - 0 to 7 inches: silt loam

Bw - 7 to 15 inches: silt loam

Bg - 15 to 52 inches: silt loam

Cg - 52 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Very high

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Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 12 to 16 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D

Minor Components

Arrington

Percent of map unit: 4 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Norene

Percent of map unit: 4 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Armour

Percent of map unit: 2 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Ma—Melvin silt loam

Map Unit Setting

National map unit symbol: 2mgzf

Elevation: 320 to 950 feet

Mean annual precipitation: 40 to 48 inches

Mean annual air temperature: 54 to 55 degrees F

Frost-free period: 165 to 205 days

Farmland classification: Not prime farmland

Map Unit Composition

Melvin and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Melvin

Setting

Landform: Depressions

Landform position (three-dimensional): Tread

Parent material: Loamy alluvium derived from interbedded sedimentary rock

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 27 inches: silt loam

H3 - 27 to 62 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D

MeC—Minvale silt loam, 5 to 12 percent slopes

Map Unit Setting

National map unit symbol: 2mgzk

Elevation: 500 to 1,200 feet

Mean annual precipitation: 45 to 55 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 180 to 205 days

Farmland classification: Not prime farmland

Map Unit Composition

Minvale and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Minvale

Setting

Landform: Hillslopes

Landform position (three-dimensional): Base slope

Parent material: Loamy colluvium derived from cherty limestone

Typical profile

H1 - 0 to 8 inches: silt loam

Custom Soil Resource Report

H2 - 8 to 33 inches: silty clay loam

H3 - 33 to 72 inches: gravelly silty clay loam

Properties and qualities

Slope: 5 to 12 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)*

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

MnB—Monongahela silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2mgzn

Elevation: 300 to 1,000 feet

Mean annual precipitation: 35 to 55 inches

Mean annual air temperature: 45 to 57 degrees F

Frost-free period: 120 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Monongahela and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monongahela

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Parent material: Loamy alluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 26 inches: silt loam

H3 - 26 to 55 inches: loam

H4 - 55 to 60 inches: loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: About 26 inches to fragipan

Natural drainage class: Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat): Moderately low to
moderately high (0.06 to 0.60 in/hr)*

Depth to water table: About 18 to 30 inches

Custom Soil Resource Report

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

MvC2—Mountview silt loam, 5 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2mh08

Elevation: 600 to 1,300 feet

Mean annual precipitation: 48 to 58 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 154 to 226 days

Farmland classification: Not prime farmland

Map Unit Composition

Mountview and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mountview

Setting

Landform: Ridges

Landform position (three-dimensional): Side slope

Parent material: Loess over clayey residuum weathered from cherty limestone

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 24 inches: silty clay loam

H3 - 24 to 66 inches: gravelly clay

Properties and qualities

Slope: 5 to 12 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

SeD—Sengtown gravelly silt loam, 12 to 20 percent slopes

Map Unit Setting

National map unit symbol: 2qh76
Elevation: 600 to 1,300 feet
Mean annual precipitation: 47 to 58 inches
Mean annual air temperature: 56 to 59 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Sengtown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sengtown

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from cherty limestone

Typical profile

Ap - 0 to 8 inches: gravelly silt loam
E - 8 to 11 inches: gravelly silt loam
Bt - 11 to 79 inches: gravelly clay

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Minor Components

Mountview

Percent of map unit: 7 percent

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Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Minvale

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Waynesboro

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

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Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

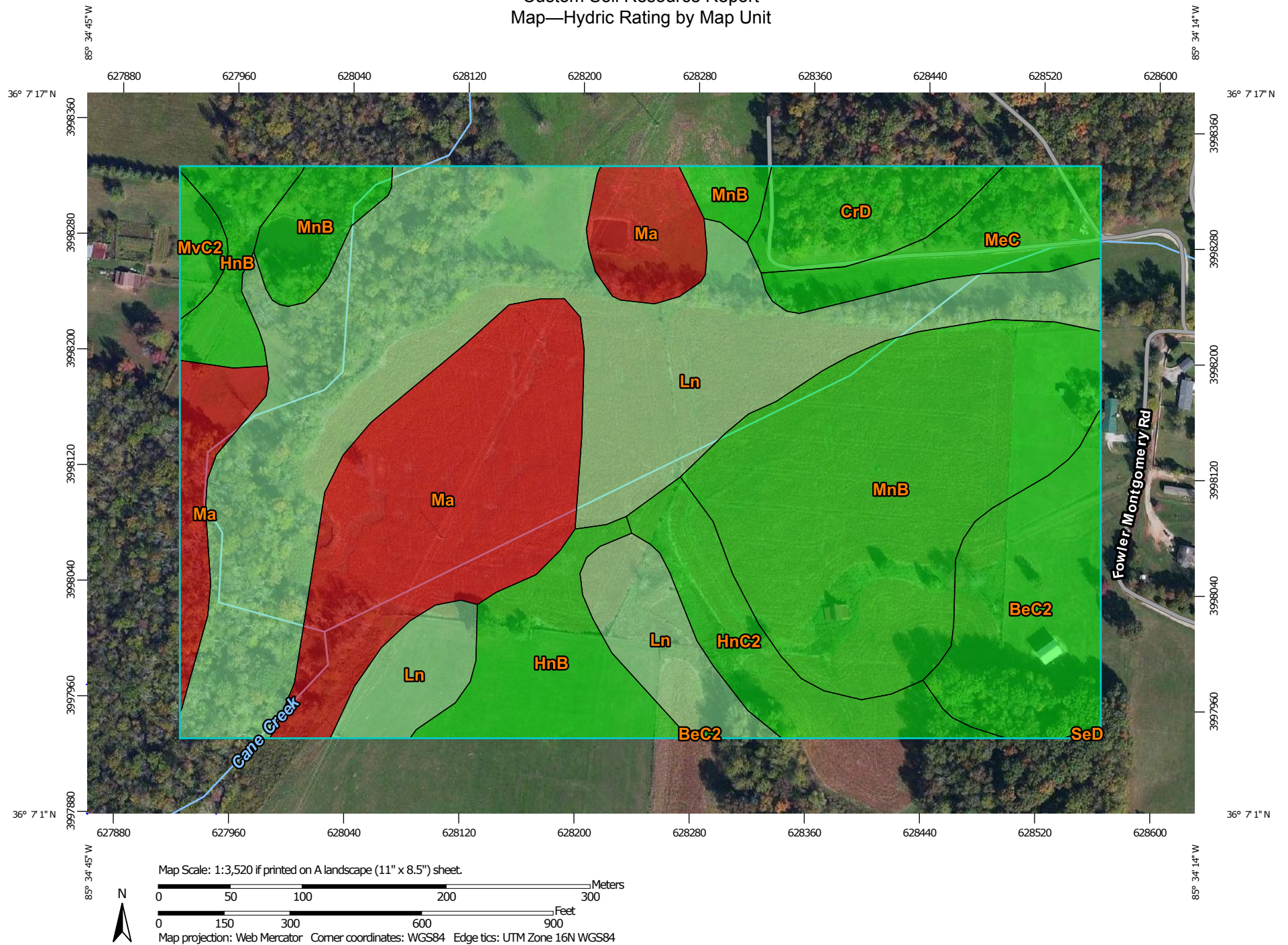
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Custom Soil Resource Report Map—Hydric Rating by Map Unit









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available






Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Putnam County and Parts of White County, Tennessee
Survey Area Data: Version 7, Sep 16, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2011—Oct 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Putnam County and Parts of White County, Tennessee (TN610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BeC2	Bewleyville silt loam, 5 to 12 percent slopes, eroded	0	4.5	7.2%
CrD	Christian silt loam, 12 to 20 percent slopes	0	2.3	3.6%
HnB	Holston loam, 2 to 5 percent slopes	0	4.7	7.4%
HnC2	Holston loam, 5 to 12 percent slopes, eroded	0	2.8	4.5%
Ln	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	4	20.8	33.2%
Ma	Melvin silt loam	100	11.4	18.2%
MeC	Minvale silt loam, 5 to 12 percent slopes	0	2.6	4.1%
MnB	Monongahela silt loam, 2 to 5 percent slopes	0	13.2	20.9%
MvC2	Mountview silt loam, 5 to 12 percent slopes, eroded	0	0.6	0.9%
SeD	Sengtown gravelly silt loam, 12 to 20 percent slopes	0	0.0	0.0%
Totals for Area of Interest			62.8	100.0%

Rating Options—Hydric Rating by Map Unit*Aggregation Method:* Percent Present*Component Percent Cutoff:* None Specified*Tie-break Rule:* Lower

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Appendix 5:

TRAM Non-HGM Scores

			Area 1		Area 2	
			Existing	Proposed	Existing	Proposed
Metric 1 Area			3	3	3	3
Metric 2: Buffer Width						
	2A: Width		1	4	1	4
	2B: Intensity		3	5	3	5
Metric 3: Hydrology						
	3A: Sources					
		High pH Groundwater	0	0	0	0
		Other Groundwater	3	3	3	3
		Precipitation	1	1	1	1
		Seasonal Surface Water	3	3	3	3
		Perennial Surface Water	0	0	0	0
	3B: Connectivityi					
		100 yr Floodplain	1	1	1	1
		Between Stream/Lake and other land use	1	1	1	1
		Part of larger wetland/ upland complex	1	1	1	1
		Part of Riparian Corridor	1	1	1	1
	3C: Maximum Water depth		1	1	1	1
	3D: Duration		3	3	3	3
	3E: Modifications		3	3	3	3
Metric 4: Habitat Alteration and Development						
	4A: Substrate/ Soil Disturbance		2	3	2	3
	4B: Habitat Development		2	5	2	5
	4C: Habitat Alteration		3	6	3	6
Metric 5: Special Wetland Communities			0	0	0	0
Metric 6: Vegetation, Interspersion, and Microtopography						
	6A: Wetland Vegetation Communities		3	7	3	7
	6B: Horizontal Interspersion		2	4	2	4
	6C: Coverage of Invasive Plant Species		0	1	0	1
	6D: Microtopography		2	2	2	2

	Area 1		Area 2	
	Existing	Proposed	Existing	Proposed
Metric 1 Area	3	3	3	3
Metric 2: Buffer Width	4	9	4	9
Metric 3: Hydrology	18	18	18	18
Metric 4: Habitat Alteration and Development	7	14	7	14
Metric 5: Special Wetland Communities	0	0	0	0
Metric 6: Vegetation, Interspersion, and Microtopography	7	14	7	14
TOTAL SCORE	39	58	39	58